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THE FILM IN THE SCHOOL



[R 604]

THE PRODUCTION IN SCHOOL—AN OPEN-AR STAGE

A hospital scene in *The Man Who Changed His Mind*. Note the solid nature of the floor, walls, and door. Framing the centre of the picture will show the "room" seen by the camera

THE FILM IN THE SCHOOL

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PREFACE

Numberless books and articles have been written to show why films should be used in schools, but very few on how they should be used.

No attempt has been made here to deal systematically with the findings of the researches or of the committees of inquiry which have considered the problem. Nor have general considerations of aims or psychological questions been raised. It has been assumed that most teachers are now agreed that it is in the highest degree desirable to introduce the film into the school and that the principal reason which has slowed up progress is lack of knowledge. The purpose of this book is to give advice, as practical and as detailed as possible, to those who would like to use films in their work. I hope it will succeed in its aim of getting this powerful aid more widely adopted.

J. A. LAUWERYS

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CHAPTER I

THE PLACE OF THE FILM IN EDUCATION

By J. A. LAUWERYS

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WITH a few exceptions, teachers in this country seem to look upon the proposal to use films as an aid to their work with some distaste and suspicion. Yet the idea is not new and its birth was almost coincident with that of the cinema itself. It is evidently not necessary here to go into historical details such as are gathered together in *The Film in National Life* and elsewhere. But it is interesting to notice that twenty years have already elapsed since the National Council of Public Morals set up its inquiry "into the physical, social, moral, and *educational* influence of the cinema, with special reference to young people". Again, as long ago as 1923, the late Mr. George Eastman initiated a comprehensive survey of the whole field of teaching films. At about the same time Spearman, Burt, and Philpot were carrying out the basic psychological investigations recorded in *The Cinema in Education*.

Reports such as these secured much publicity and wide approval. Together with the strenuous spade-work of enthusiasts they certainly made teachers aware of the immense possibilities of the new instrument. In any case, it was not difficult to convert them to a belief in its utility and in its power. In the short space of one generation the cinema had established itself as, perhaps, the

most potent single influence in our civilization. The multiplication of palatial theatres—and their attendant queues of “fans”—testified to its attractiveness to all sections of the people.

Furthermore, the use of visual aids is recommended by all who put forward demands for fundamental changes in conventional methods and curricula. In fact, practically the only factor common to all the newer schemes is their protest against the overwhelmingly linguistic bias of our education. A mere knowledge of words and a superficial acquaintance with concepts acquired at second hand are condemned as harmful and useless. What is asked for is the cultivation of an interest in real things, an understanding of the connections between them, a concentration on what can be seen and perceived at first hand.

Films offer one of the easiest ways of conveying to the child some knowledge of a world wider than that of the home or of the school. And information is presented to him by pictures, satisfying and easy to understand, rather than by comparatively abstract words the full meaning of which is often beyond him.

Teachers are not blind to these arguments. On the contrary, they are widely understood and accepted—but they do not lead to action. It is difficult to obtain exact and reliable figures, but it is probable that in our 32,000 schools not many more than 1,000 projectors are in use.¹

It is, therefore, both interesting and important to consider how this difference between desirable possibilities and disappointing actualities can have arisen.

¹ In 1930, 300 schools used the film. This figure should be compared with the 9,000 projectors of France and the 20,000 schools using films in Germany. In the U.S.A. there are 400 *producers* of educational films and in Japan 91.

Of course, there are financial difficulties—there always are in education. Even now, in spite of numerous price reductions, a silent projector costs from about £12 and a sound-on-film projector from £75 upwards. Yet the experience of other countries shows that difficulties of this kind are not insuperable. If teachers were really determined to use the cinema the necessary money would be provided, much in the same way that money has been found to build and equip the excellent laboratories demanded by science specialists.

But here, precisely, lies the crux of the situation. There has been no unanimous or forcible demand from those who would actually be using the projectors. Undoubtedly, this is due partly to quite natural conservatism. As a result of long experience, handed down from one generation to another, teachers have learned to use effectively blackboard and chalk. In much the same way, geographers have learned to use pictures and atlases, scientists have learned how to weld experiments and demonstrations into a lesson, and historians are beginning to learn the advantageous use of source-material and of dramatization. Now comes a demand for the utilization of a new instrument, some forms of which are rather complicated. What is to be done with it? How is it to be used to produce better results? How can it help to make boys and girls think for themselves? Will the improvement in width and depth of learning justify the extra trouble?

The answer to these questions is by no means clear: there is no general consensus of opinion, no authoritative body of experience to which appeal can confidently be made. As a result, many teachers seem to be convinced that the film will be of immense value in every subject

but their own. Geographers form an honourable exception to this sad state of affairs. They alone are unanimously in favour of the cinema. Their attitude is due to two things: a better supply of films is available for their subject than for most, and, what is even more important, they have actually used them in the class-room and have thus gained confidence from experience.

In brief, the lack of real enthusiasm is due mainly to lack of knowledge and only the passage of time can be expected to cure this comparative apathy. Training colleges are beginning to instruct their students, summer schools are giving advice to practising teachers,¹ and it is with the idea of helping to spread the new ideas that this book has been written.

Foreground and Background Films.—Before considering details of technique or of choice of equipment, it is highly desirable to point out that the films available for use in schools fall broadly into two classes.

Those of the first, the *foreground* or class-room films, have been specially designed for incorporation into the ordinary routine. They stand on the same level as an atlas or an experiment: they are an intrinsic part of the lesson and convey ideas or information which could not be conveyed in any other way.

Films such as these can be used by the teacher to show phenomena which necessarily and intrinsically involve motion, or which are of so unusual a nature that it is difficult to present them in fact. He would thus use them

¹ e.g. The E.H.A. Film Summer School at Scarborough (annual). Details may be obtained from J. W. S. Kay, Esq., 74, Limesdale Gardens, Edgware, Middlesex.

as a sort of mechanical blackboard. Diagrams to illustrate military or naval campaigns, difficult experiments on surface tension, and descriptions of industrial methods are obvious instances.

It is usually admitted that these films must not attempt to replace work that could be done by the teacher. Simple experiments, which could be done quite well as demonstrations, must only in the rarest instances be shown on the screen. Diagrams which can be drawn on the blackboard or on cardboard need not be filmed. No one contends that moving pictures are better than the things themselves. It is only argued that they are more effective than the spoken or printed word for conveying ideas or information to children. The point is, really, that the use of films widens the scope of the teacher: it does not replace him nor should it encourage him to laziness.

Cyclic films,¹ also, fall into the foreground class. Each of these consists of an endless loop of film showing a diagram of any process which repeats itself at regular intervals; e.g. wave motion, the working of a dynamo, the functioning of a steam engine. Such films can be passed through the projector as often as is necessary for the explanation to "get home".

It is not necessary here to discuss methods of using classroom films—the subject is dealt with in detail in a subsequent chapter. It may be as well, however, to mention now that it is assumed that silent films will be used for

¹ The Dance-Kauffman films. These diagrammatic films are supplied in two forms: (a) the endless band, (b) 50-ft. (two minutes) reels. On the latter films each unit effect is repeated from six to twenty-five times. The movement seems perfectly continuous and the films can be run on any projector without adaptation.

this particular purpose. For two reasons: first, it is probable that such films lend themselves more readily to that teaching technique which experience has shown to be most effective. Second, the cost of films and of projectors may always prevent sound apparatus from being installed in every class-room, or at any rate from being available in numbers sufficient to lead to their universal and continuous use.

But using films in class-rooms during ordinary lessons does not exhaust their possible utility. We may also try directly to widen the children's ideas, or to interest them in some aspect of life which is not touched on in the ordinary curriculum. Films which thus help to broaden the outlook of the pupils are called *background* films.

Many excellent films of this class have already been produced and endless suggestions for others could be made. In history, the trades of journeymen and craftsmen in the past or changes in methods of travel and transport, and in science the interconnection of scientific knowledge and industry, or the practical applications of physical research, can be easily illustrated. Reference to the catalogues of any film library will yield a multitude of examples.

It is obvious that a distinction of this kind (foreground—background) is, to some extent, artificial. Although it very greatly simplifies discussion, it is not really sufficient. For example, where in our classification should we place revision films? They will use a technique somewhat different from that of the ordinary foreground film and may well deal with far more facts. Yet they can scarcely be called background films. On the other hand, it is clear that there are several varieties of the latter. Sometimes we

may be trying mainly to cultivate sensitivity to artistic values, while at other times we may be trying to convey a general sense of the "atmosphere" of an historical period or information about the occupations and industries of a particular region.

Possibly, therefore, we ought to sub-classify background films themselves into

- (a) those that are mainly informative,
- (b) those used mainly for training taste.

Be this as it may, there is one point common to all films which are of any use in the school: they must be first-class material and the technique used by their producers has to be such that the products can be compared with the photographically excellent films shown in the commercial theatres. It is quite legitimate to apply to them the same criteria as those which the children will naturally apply by unconscious comparison with the films familiar to them.

At the same time, it is important to realize that foreground films necessarily aim at a perfection distinct from the dramatic perfection which satisfies the emotions: at the scientific perfection, that is, which satisfies the intellect. They should be clear, lucid, simple, and logical. Their length should be such that they take not more than ten minutes¹ to show. The average school lesson is too short to incorporate a longer period of projection, and an informative film which lasts ten minutes will already exhibit far more facts than a child can hope to master in an hour.

In connection with this matter of excellence of produc-

¹ Preferably far less. There are some very good three-minute films available.

tion one last remark must be added: it is in the highest degree desirable that films to be shown to children should be aesthetically valuable. "The taste of the next generation is largely formed at school—children's receptiveness and power of association are being trained; and this training is possibly not the least of the services which the new medium may render—if the material is right. It is as important to train their taste in films as in music; from the social point of view, more important. We cannot provide children with a better equipment than a strong dislike of the inferior and the commonplace even in this sphere."¹

Sound or Silent?—Discussions such as these cannot be carried on in isolation from considerations as to whether we have in mind sound films or silent films. During the last ten years the former have entirely ousted the latter from the public cinemas. The completeness of their triumph has convinced producers of their superiority for all kinds of work. Some people, even among teachers, believe that only sound films should be used for both background and class-room purposes. ◦

The decision as to which kind of film is to be used is partly dependent on technical considerations. This aspect of the matter is discussed by Mr. Waley elsewhere. But it is also a matter of educational principles and of psychology. It is clear that a full, complete, and authoritative statement could only be made on the strength of lengthy experience with both forms and of much objective psychological research. At the moment we are not even quite sure of what it is we hope to achieve.

¹ *The Film in National Life.*

While it is thus impossible to dogmatize, it is certain that the problem is usually stated quite wrongly. The question is not really "Are sound films better than silent films?" but "For such-and-such purposes, ought we to use sound films or silent films?"

In Mr. Fairgrieve's article he states the cogent and convincing arguments which have led him to the conclusion that, for most *class-room* purposes, the film should be silent. Nearly all those who have actually used films to teach children support him in this opinion.

■ A pedagogic principle of general applicability reinforces their position. It is admitted that the complexity of the means used to explain facts or phenomena must always be kept down to a minimum. The child's attention must never be diverted from an explanation itself to the means employed to explain. The supporters of the silent film are on firm ground in their plea for the utmost simplicity attainable.

Nevertheless, it must be admitted that there are teachers who prefer sound films. There is no doubt at all that those recently produced for the class-room are very beautiful indeed. It is certain that they could be used to give highly effective lessons and that children would enjoy them and would be stimulated to purposeful work.

To this, one should add that certain class-room subjects are excellently suited to the technique of the sound film. The teaching of foreign languages or of musical notation, and topics such as the function of the various instruments of the orchestra or certain sections of acoustics, are obvious examples.

Finally, a few objective researches have been carried

out, chiefly in the U.S.A.,¹ to compare the value of sound and silent films. On the whole, they support the sound film. But it must be pointed out that many of these experiments are quite valueless. The "silent" film used has been merely the sound film robbed of its sound. Actually, the technique of producing the two forms is quite different, and to make the experiments really valuable they should be carried out by equally gifted teachers using specially prepared films of each sort.

Background films, however, are obviously in an entirely different class. Here it is almost certain that sound possesses enormous advantages in aiding effective presentation and in securing life-like reproduction. The greater realism of the sound film probably leads to its making a stronger and more lasting impression on the minds of children. The latter have learned to expect a background of sound, because they get it when visiting the ordinary cinema. In consequence, they may possibly become dissatisfied and lose interest when only silent films are shown.

It is also often urged that producers are able to call on the services of acknowledged experts when preparing a narration. The commentary supplied by these is likely to be more effective and more correct than that of ordinary teachers, who may be less thoroughly acquainted with the film and with the field it covers. Clearly none of these arguments holds when foreground films are being discussed. These do not stand alone but are only a comparatively minor part of a lesson dominated by the teacher himself. Nor would there be any excuse for a teacher who was unfamiliar with a class-room topic—or

¹ e.g. Devereux, *The Educational Talking Picture*. See especially the account of C. C. Clarke's research, pp. 67-72.

with a short film illustrating it—which he had chosen himself.

Besides their numerous uses in the schools, sound films can also play an important part in the education of the adult. Here the lecture technique is more appropriate than in the school and interest can easily be aroused by even second-hand contact with outstanding personalities. Further, it becomes more difficult for ordinary teachers to maintain (when showing a film) the standard of accuracy and of expression expected by and suitable to intelligent adults. A prepared narration can then play a most useful role and can quite well be intimate, vivid, and thought-provoking.

To sum up this discussion, therefore, we may say that, for background purposes, sound films are usually preferable. For class-room purposes, silent films are more likely to be effective:

- (a) for pedagogical reasons;
- (b) for technical reasons discussed by Mr. Waley in a later chapter;
- (c) for financial reasons, since costs necessarily have to be kept down to a minimum and since (owing to increased costs of production, longer films, and more expensive apparatus) the final cost of showing a sound film will always be at least double the cost of showing a silent film.

What Projectors should be Bought?—Bearing all these considerations in mind, we have to decide on the kind of apparatus to be bought. Here again the technical considerations are discussed by Mr. Waley.

Reasons have already been given which support the

view that sound films can play a very important part in the school. Evidently it is therefore desirable to purchase a sound projector since this can nearly always be used as a silent machine while the converse is never possible.¹

The ideal solution, of course, would be for every school to possess one good quality sound projector for use in the School Hall and two or three silent projectors for use in the class-rooms. If financial difficulties make this impossible, one 16-mm. sound projector would be the next best thing. But a 16-mm. silent projector is really the only *essential* instrument, since this will be the machine actually used in ordinary teaching. Incidentally, many teachers (including the writer) prefer a hand-driven to a motor-driven projector for class-room use.

There are two kinds of sound projectors: sound-on-film and sound-on-disc. In the former the sound forms an integral part of the film; in the latter it has been recorded separately on gramophone discs, the running of which can be synchronized with that of the film. The Governors of the British Film Institute, after mature consideration and much discussion, have recommended "that schools contemplating the use of cinematography should only consider projection apparatus* which fulfils the following requirements:

- (a) Size of film, 16 mm.
- (b) Sound-on-film, conforming to the I.C.E. standard.²
- (c) Projectors to be capable of showing both sound film and silent film at their appropriate speed."

¹ Notice, however, that this is not quite true: the sound projector will still be more complicated and the film travels much faster than in the silent machine.

² See page 37.

The Road Show Service.—What has been said above does not exhaust all possibilities. It is quite possible for a school to possess no sound projector, or even no projector at all, and yet to make full use of *background* films. There are two ways of doing this: one is by means of the Mass-Demonstration, described fully by Mr. Griffith; the other is by making use of the Show Services arranged by some of the larger firms.

The Western Electric Company,¹ for example, have divided up the whole country into sixteen areas. In each of these they possess supplies of 16-mm. portable talking picture equipment, transport facilities, operating staff, and a local library of films. They send round salesmen and contact men to call on schools to arrange programmes.

At the moment they are carrying out exhibitions in non-theatrical halls of all types (schools, clubs, institutes, etc.) at the rate of between 1,000 and 2,000 shows per month.

As the demand develops, the organization will be expanded to meet it.²

The basic idea of these Show Services is that the School—or local authority—is entirely relieved of capital expenditure and pays only the hiring fee. The latter is not large if arrangements are made by which a large number of children can view the programmes offered.

Both the Mass Demonstration and the Show Services can play a very useful part. Which is actually chosen will depend, to a large extent, on local circumstances and on

¹ Fuller details can be obtained from this company at Bush House, Aldwych, W.C.2.

² The Gaumont-British Company and Publicity Film Ltd. are also prepared to hire projectors and operators to schools, etc.

the kind of programme to be shown. Neither competes with the class-room use of *foreground* films: they supplement them.

The Supply of Films.—Perhaps the most deplorable feature of the present situation is that we seem to be involved in a vicious circle. Producers are naturally reluctant to spend the large sums required to make films which will not be widely used. Teachers, on the other hand, hesitate to buy projectors while useful films are not being produced in large numbers. As a result, very little is done. Yet the position is not nearly as bad as is often assumed. Reference to the lists given will show that a large number of films is already available. Many of these are really very useful in the class-room and could be used without any alteration at all, while others could easily be adapted.

One of the principal difficulties of the moment is that general principles have not yet been worked out or stated. Perhaps they may have to be developed by trial and error, the method which has led to the vast improvement noticeable in the school text-books of to-day compared with those of the past. It may even be possible, ultimately, to put the whole business on the same footing as book publishing: a teacher might take his script to a firm, get it accepted, and draw royalties on the sales or hiring fees of the film.

This would certainly have many advantages. A useful foreground film must satisfy needs felt in the class-room, and practical teachers are in the best position for judging the quality of the products and for deciding on what is really required.

Steps have already been taken to secure some measure of teacher-producer co-operation. Miss Mary Field describes, further on in this book, how the British Film Institute can help teachers who wish to get their ideas translated into films.

The information on film-production which is given in the same chapter is also useful in helping to understand the technical and financial difficulties which have to be considered.

It is worth insisting on the importance of all this because the future successful use of the cinema in the school is so closely bound up with the possibility of obtaining films easily and cheaply. The ideal to be aimed at would be for every school to build up its library of films, suited to its own needs and to local conditions. Such an idea is by no means Utopian: already each High School in Italy possesses its own library of ninety films. It is thus possible for a teacher, who finds that he would be helped by a particular film, to go to the library and secure the reel he requires.

Until these school libraries are established, the next most promising development would be to persuade Local Education Authorities to set up film libraries in all the larger towns.

Naturally, this idea would mean that films would have to be very much cheaper than they are. Yet, with mass-production and film editions of several thousand positives, this should not be impossible. Until now, producing firms have scarcely contemplated issuing for sale 25-, 50-, or 100-ft. lengths of film, dealing with some restricted classroom topic, at a price comparable with that of a book.

A modest beginning, however, *has* been made: a number

of cyclic diagram-films can be bought at a very moderate price.¹

At the moment, the only way of getting films is to hire them from producing firms. The expense involved is certainly not great, but it is a distinct handicap to schools whose resources are severely limited. A further drawback is the extra trouble which has to be taken: the films have to be ordered, unpacked, repacked, and sent back again, the teacher must see to it that the film required is there in time for the particular lesson in which it is to be used, etc. All this, of course, means that background films, which can be shown to the whole school, are being used more widely than the few foreground films already available.

Film Production in School.—Even the most cursory outline of the part which can be played by the cinema in the school would be quite incomplete without some reference to the making of films as an additional school activity.

It is not argued that every school should have its film production department. But, given the right teacher and the right circumstances, there are definite educational advantages in the study and pursuit of amateur cinematography.

A great deal of nonsense is talked and written nowadays about practical activities. There are people who speak as though their introduction into the school will provide us with a final and ready-made solution to all educational problems. Actually, there are no grounds whatever for supposing that a child who is backward in academic work will naturally excel at practical work.

¹ See footnote, p. 17.



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THE LAKE VILLAGE

Real huts were made. One was left open at the rear for interior shots. Note the graded heights to give distance. Also the dug-out canoe. The whole set was made by boys.

All the evidence available is against such a conclusion. What is true is that it is easier to find worth-while work which can be done by backward children if practical activities are widely used than if they are completely excluded.

Nor can it be said that practical activity is in itself better, nobler, or more worth while than pure brain work. This would be carrying the reaction against the academic bias of our education altogether too far.

Inasmuch as the newer tendencies stress the need, in the process of teaching, for a closer union between hand and brain, they are all to the good. On the appreciation side alone, it is certain that, by learning to paint or to make things out of wood and metal, children will increase their power of appreciating pictorial art and craftsmanship. Even though a child may never become a Beethoven, yet learning to play the piano is likely to make him a better and more critical listener. In the same way, the comparatively futile efforts of a school film-producing society may help in the development of more acute and critical film audiences.

While film-taste could probably be trained to some extent by showing films and *discussing* the reasons which make them good or bad, actual production is likely to achieve more. Nor would the quality of the taste developed depend merely on the quality of the films produced. There is, of course, no reason why the two kinds of work should not be combined!

Concern is often expressed at the idea that children may allow their cinema experiences (i.e. in the commercial theatres) to have too great an influence on their conduct, that they might become "emotionally possessed" by them.

It has, however, been shown that adult detachment is soon developed. The growth of this desirable attitude is fostered by giving direct instruction on film production. Detachment comes with learning how pictures are made, how effects are secured, what to look for in pictures, and what makes pictures artistically good or bad.¹

Besides helping towards the attainment of indirect aims, such as the above, the children's efforts will yield film records of school events—the opening of a school, speech days, gymnastic displays, school journeys, etc. These will always have considerable interest and topical value, and it has even happened that the local cinema has been willing to pay for exhibiting a peculiarly interesting film.

The apparatus required is not at all expensive: quite good cameras may be obtained for from £10 to £20. Usually, the film used will be 9·5 mm. in width, but experienced amateurs prefer the ordinary 16-mm. width. It is true that this costs three or four times as much, but it permits the employment of a more developed technique and shows the scenes to greater advantage. It will usually be found convenient to allow a commercial firm to do the developing and printing of the films. Their charges are not high.

The recent growth of amateur cinematography and the production of film stock allowing coloured pictures to be taken (these cost 50 per cent more than the black and white, i.e. about 15s. per 50 ft., including developing and reversing) are likely still further to encourage this new activity.

¹ W. W. Charters, *Motion Pictures and Youth* (Macmillan Co.). See the study, *Movies and Conduct*, by Herbert Blumer.

There are two principal ways of organizing school film production. The first is the method followed by one of the most successful of amateur film producers, Mr. Ronald Gow, and described by him in a chapter of this book. The other is to set up a school film society.

The organization, aims, and methods of the latter will depend to a large extent on circumstances. As a rule, it will be convenient to divide the society into two sections: for exhibition and production respectively. If a small charge be made to the children who wish to see the programmes offered, it will be possible to pay part of the costs of the producing section. The latter will function best if the work is shared out among the boys according to their interests: for instance, there might be directing, technical, and acting groups. The subject is ably discussed in an article in *Sight and Sound*, by Mr. Maxwell Lewis,¹ who makes many interesting suggestions.

The Need for Research.—In spite of all the work already done it is clear that we are still far from knowing the full possibilities and limitations of the new medium. Much research is needed and much experience will have to be accumulated before teachers will be in a position to use it so as to obtain from it all the advantage it can yield. But all sides of education offer opportunities for constructive research: it is precisely this that makes teaching an occupation at once so stimulating and so fascinating.

This work will have to be done in the class-room, in the study, and in the laboratory. Teachers will have to

¹ *The School Film Society*, A. Maxwell Lewis, *Sight and Sound*, Summer, 1934. See also *Training Film Taste*, Ernest Dyer, *Sight and Sound*, Autumn, 1934.

find out how to weld films of different kinds into unified and coherent lessons, dealing with all the different subjects of the curriculum. They will have to learn where films can be a distinct help and where they would be merely a hindrance, how far they can be combined with the use of lantern slides, how to adapt film instruction to various ages, what place animated diagrams will take in the different fields of study.

Psychologists are faced by a whole host of unanswered questions: When and where does visualization help in the building up of concepts? How can images of particular scenes develop or hinder imagination? Which parts of different subjects are intimately concerned with visual concepts? How far do films help backward children?—The list could be extended almost without limit.

Again, the adaptation of films to the needs of special classes (e.g. in instruction for the deaf and dumb) raises many special problems for both practical teachers and research workers. As for the educational philosopher or theorist, there are enough problems here to occupy him for many years. Aims and principles have to be worked out, the effect of more concrete presentation of facts and ideas should be considered, while the immediate and remote reactions of children to the films they see at school form a fruitful field of investigation.¹

Of course, a good deal has already been done. The results of numerous researches and inquiries are gathered in impressive reports, most of which can be easily obtained (p. 135). An important function of the Film Institute is to co-ordinate this information and to make it widely available.

¹ Cp. *Motion Pictures in the Class-room*, pp. 226-7.

The fact that we do not know all there is to be known about the use of the cinema in the school is not an excuse for still further delaying action : it should act as a stimulus and a challenge. It would be foolish for teachers, in this country alone, to continue ignoring so powerful an aid to their work. If they really believe in the aims they profess, it should not be difficult for them to remove the comparatively trivial obstacles that still stand in the way of its general adoption.

CHAPTER II

CHOOSING A PROJECTOR

By H. D. WALEY

Technical Editor of "Sight and Sound"

FILMS cannot be employed successfully unless the projection apparatus is suited to the room or hall used for the display. In all cases a clear and brilliant picture which everyone, wherever seated, can see without strain is the first essential. To obtain this picture it will be necessary not only to choose the projector itself carefully, but also to use a suitable screen, without which the best and most costly projector is useless.

In the first place, we must therefore consider the ordinary types of projectors available and the technical differences between silent and sound machines. But it is also highly important to consider the different varieties of screens and the limitations and advantages of each.

PROJECTORS

Standard or Sub-standard.—The first decision we have to make, when selecting a projector, is whether we shall use the standard gauge, using film of 35-mm. width, or the sub-standard 16-mm. gauge. The advantages of sub-standard film are portability, cheapness, and safety, since all sub-standard film is of the non-flam type. Certain educational films, notably those of the Kodak and Ensign libraries, are obtainable on 16-mm. film only. Present tendencies seem to indicate that all films made in the future for educational purposes will be available on 16-mm. stock. On the other hand, a good many films of

cultural interest and mainly intended for theatre circulation are likely to remain procurable on 35-mm. stock only.

It will be clear that 16-mm. film is limited as regards both light output and sound output. In both respects, however, rapid strides have been made recently, the limit for picture-width now being about 18 ft. and for sound volume an energy output of about 15 watts (i.e. sufficient for a hall containing some 1,200 people). Above these limits 35-mm. film is requisite.

Sound or Silent?—The next, and rather more difficult, decision is whether to purchase a silent or a sound projector. The principal factors affecting this problem are expense, mechanical complication, the range of films available, and, most important of all, the teaching technique employed. This last point is being discussed elsewhere, and it is on it that the problem of future educational film production—whether it is to be mainly sound or silent—really hinges. At the moment, the films under production are almost entirely sound films, of which silent versions are not yet available. A summary of the present position is presented at the end of the book under the heading “Principal Film Libraries” (Appendix, p. 135).

With regard to expense, it may be said that, roughly, sound apparatus costs about twice as much as silent apparatus adequate to cater for the same audience. It is possible, of course, that future manufacturing developments will diminish this difference.

The Board of Education is prepared to make grants towards the cost of purchasing film apparatus on the scale of 50 per cent to Secondary Schools and 20 per cent to Primary Schools.

The mechanical complications incident to sound apparatus have been reduced to a minimum by the exercise of considerable ingenuity, but the following appear to be ineradicable:

- (1) Different speed for silent film and sound film.
- (2) Trailing of loud-speaker flex from projector to screen.
- (3) Need for suitable mains current.

(1) Whereas 16 pictures per second is the normal taking and projection speed of the silent film, variable within wide limits, a speed of 24 pictures a second, rigidly controlled, is a necessity for the satisfactory projection of sound films. Wrong speed betrays itself as false pitch in the sound. Accordingly sound projectors will not show silent films at their proper speed unless a special speed-controlling device has been incorporated for this purpose.

(2) The use of sound film involves the placing of a loud-speaker near the screen. The wire connecting the speaker to the amplifier necessarily passes over, under, or round the audience and care has to be taken to prevent it from being fouled when the audience passes in and out. In most cases, of course, this is quite easily accomplished.

(3) The simplest method of obtaining that constancy of speed which is essential to good sound is the use of a driving-motor which takes its speed from the frequency of the mains supply. About 68 per cent of the electricity undertakings in the United Kingdom now supply alternating current with a frequency of 50 cycles a second. Sound film projectors are designed for running on this type of supply, differences of voltage being allowed for

by variable resistances. Of the remaining 32 per cent of undertakings which do not conform, about 17 per cent supply direct current and 15 per cent alternating current with frequencies other than 50. Sound film projectors can be run on direct-current supply by the use of a rotary converter. The problem of using alternating supplies with non-standard frequencies is far more complicated. Accordingly the suitability of the mains supply should be inquired into before it is assumed that a portable sound projection set can be installed.

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I.C.E. Standard.—Unfortunately, the 16-mm. sound film position is at present complicated by the existence of two standards, known as the I.C.E.¹ and the S.M.P.E.² Sound film of 16-mm. width is perforated down one side only, the unperforated side being left free to carry the sound-track. According to the S.M.P.E. system of projection the perforated edge of the film, and consequently also the sprocket-teeth on the projector, is on the side nearer the operator. In projection according to the I.C.E. system it is the sound-track which is on the side nearer the operator. The practical result of this difference is that an I.C.E. film, when run through an S.M.P.E. projector, appears on the screen reversed left to right. However, this can be rectified by using a prism. A movement to secure a world standard is on foot.

All educational films at present being made in this country on 16-mm. sound film are in accordance with

¹ I.C.E. = Instituto per la Cinematografia Educativa, the body charged by the League of Nations with the duty of exploring the educational possibilities of the cinema.

² S.M.P.E. = Society of Motion Picture Engineers, a representative American body.

the I.C.E. standard, and the British Film Institute have officially adopted it.

35-mm. Sound-on-Film.—35-mm. sound-on-film projectors are more expensive and less portable than 16-mm. sound-on-film projectors. They also generally involve their users in the structural complications attendant on compliance with the Home Office Regulations¹ for exhibitions where inflammable films are used, as the supply of 35-mm. non-flam films is very limited.

Many of the more stringent of these conditions (e.g. all exits to open outwards, fire-proof projection-box, separate rewinding room with teak or oak door 2 in. thick, no voltage inside the projection-box to exceed 250 D.C. or 125 A.C.) do not apply to portable projectors conforming to a given specification. Unfortunately very few of the 35-mm. sound projectors now being made do conform to it. In all other respects they have the advantage. For a given screen size the degree of enlargement required from 35-mm. film is only about one-quarter of that required from 16-mm. film. This renders possible better illumination, more precise detail, and less "grain". The greater speed at which the film travels enables a more truthful rendering of sound to be given, because the high-frequency harmonics, which give colour to the fundamental notes, are not slurred over to the same extent. Moreover, the wider sound-track enables adequate volume of sound to be secured with less distortion.

Stop and Reverse Action.—Most teachers will find it

¹ Statutory Rules and Orders, 1923, No. 983, are obtainable from H.M. Stationery Office, Kingsway, W.C.2, post free 8d.

necessary to be able to keep particular shots on the screen for a short time by holding the film still in the projector. It will also be found desirable to run the film backwards, to allow repetition. Most projectors now allow of both these possibilities, others of one only and a few of neither.

It must be admitted, however, that there is no unanimity among teachers regarding the desirability of these features. In general, the editing of a modern teaching film aims at avoiding the necessity for stopping the projector or running the film backwards. Where the editor feels that a stationary image is needed, it is produced by introducing a length of running film carrying a series of identical images, while where he feels that difficulties in comprehension are likely to arise he makes his points slowly. To what extent the editor should thus aim at imposing final form on a teaching film, rather than rest content with furnishing to the teacher raw material to be worked on at his own discretion, is a question which lies outside the scope of this chapter.

TYPES OF FILM

For the sake of simplification, only three types of film have hitherto been considered admissible for educational use: the 16-mm. silent, the 16-mm. sound-on-film, and the 35-mm. sound-on-film. Actually, of course, there exist in addition to these types the 8-mm., the 9.5-mm., the 16-mm. sound-on-disc, the 17.5-mm. and the 35-mm. silent. The future of school film library facilities clearly depends on the imposition of the highest possible degree of uniformity on the apparatus used for educational purposes. Nevertheless, the possibility of purchasing

or hiring outside these three principal types still has to be considered.

35-mm. Silent.—The present trend of development is away from the 35-mm. silent film. Nevertheless, there is still a fairly large amount of 35-mm. silent film of an educational type available and there may be cases where the purchase of a 35-mm. silent projector is under consideration. The arrival of the sound film for theatre use and of the sub-standard film for non-theatrical use threw upon the second-hand market large numbers of silent 35-mm. projectors which may be purchased for a few pounds. When they are to be handled by amateurs they should be fitted with filament lamps. Moreover, it should be borne in mind that even a low wattage filament lamp may easily ignite a celluloid film. It is much preferable to purchase one of the 35-mm. silent projectors specially designed for educational use. If an enclosed projector of antiquated type is bought care should be taken not to purchase one with a film capacity of less than 1,000 ft. (15 minutes' showing). There can, however, be very few cases where a second-hand 16-mm. silent machine would not be a better investment.

9·5 mm.—A school which restricted itself to the use of 9·5-mm. film would be placing itself outside the main current of educational film production. Nevertheless, it has to be realized that, for those who desire to purchase film rather than hire it, the facilities at present offered by the 9·5-mm. film exceed those offered by the 16-mm. and 35-mm. films. In these circumstances it may be felt that the claims of projectors with interchangeable parts

which will show both 9·5-mm. and 16-mm. films deserve serious consideration. These would also be appropriate in cases where the production of school films with a 9·5-mm. camera was contemplated.

16-mm. Sound-on-Disc.—The educational sound films now being produced in this country employ the sound-on-film method. In America, Chicago University assisted in the production of some fine films, of which the Western Electric Company has made English versions, mostly sound-on-disc. These are available through their Road Show Service. This provides for the hiring out of films, projectors, and operators, by agents distributed throughout the United Kingdom. Another connection in which sound-on-disc may serve the purposes of education is for experimental sound film work. Home-recorded discs are comparatively easy to make and their turntable can be linked to the projector by simple mechanical methods.

SCREENS

Silver and Beaded Screens.—The function of a cinema screen is to reflect back the light thrown on to it by the projector so that all members of the audience receive as large a share as possible and as equal a share as possible. A rather transparent screen (untreated fabric, for example) loses light by transmission, a dirty screen loses light by absorption, and a too highly reflective screen throws the light straight back into the eyes of those in the centre of the audience, leaving those on each side at a disadvantage. The most reflective screens on the market are described as "silver" screens, and should only

be used in cases where no one will try to view the screen from an angle wider than 25° —that is to say, either for small audiences who can group themselves in the centre of the room or for larger audiences where the shape of the room is unusually deep and narrow. The type of screen which is most efficient, where wider viewing angles are inevitable, is that known as the "beaded" screen. Beaded screens made by reliable manufacturers are expensive. For sizes varying between 2 ft. and 13 ft. in width, prices range from £2 to £47. Economy in that direction is not, however, to be recommended. The success of the showing depends very largely on the quality of the screen.

Home-made beaded screens are liable to gather dirt which it may be difficult to remove without spoiling the screen, and cheap beaded screens have, as a rule, a very low level of efficiency. Unfortunately, since there is no stereotyped definition as to what constitutes a beaded screen, some sold under this title have no clear claim to it. Both silver and beaded screens are obtainable in forms suitable for hanging on the wall or standing on a support.

Home-made Screens.—In cases where the projector is working well within its capability as to light output, a home-made screen will be found quite adequate, though of course a bought screen of good quality will give added brilliance. For portable screens up to 6 ft. wide, plain white oilcloth obtainable in 54-in. widths at about 3s. a yard may be used. It rolls without creasing and is easily kept clean. Its drawback is that it will show a disagreeable flare-spot if the projector is so situated that its

beam reflects back directly into the eyes of any of the audience. Normally in class-rooms and assembly halls it will be found that the projector is situated lower than the centre of the screen and consequently that the direct reflection of its beam passes over the heads of the audience when seated. Where it is not essential that the screen should roll up, a variety of home-made screens is possible. The actual wall of the building may be used if treated with white distemper. In this case the appearance of the picture will be enhanced by painting a dark framing round the portion of wall which is to act as a screen. For screens up to 8 ft. by 12 ft. a sheet of composition board or thin plywood reinforced with light battens and painted with white distemper may be obtained from a builder for a few shillings. A rigid screen, which weighs less and can be obtained in large sizes, may be improvised by ordering a cheap quality canvas ready mounted on stretchers from an artists' materials merchant and simply painting it over with white distemper.

Transparent Screens.—There is an important alternative to using an opaque screen which reflects the light from the projector: a transparent screen may be used which transmits it. This method is called rear projection as, from the point of view of the audience, the projector is situated behind the screen. The teacher-operator using this type of projection therefore has the advantage of facing his class. Moreover, screen-brilliance is increased and therefore more extraneous light in the room is allowable. Its applications will be further discussed in the next chapter. In this chapter it will be sufficient to point out that since rear projection involves the use of a short-

focus lens (say 1 in. for 16-mm. film and 2 in. for 35-mm.) only those projectors which can be conveniently fitted with one are suitable for the purpose. From time to time specially prepared transparent screens have been advertised as "daylight" screens and surprising claims made for their performance, which, however, have not been confirmed by experience.

Transparent screens, like opaque screens, range themselves between two extremes in accordance with their diffusive power. The least diffusive give a brilliant light straight in front which falls off rapidly when viewed from an angle, while the most diffusive give a less brilliant light, which, however, is more evenly distributed. Ground (or acid-etched) glass, which should be set with its matt face to the audience, is a good screen of the type which requires a centrally grouped audience. If its weight and fragility are objected to, "Celastoid" (a British Celanese product), matted on one side, makes a substitute free from these defects. Tracing paper, or, better still, tracing linen, makes quite good transparent screens which give a less brilliant picture but hold it well when viewed from an angle.

Size of Screen.—With regard to the size of screen required for a given audience or a given size of hall, it is difficult to lay down dogmatic rules. Colonel Devereux, in *The Educational Talking Picture*, states that the width of the picture should be as much as one-sixth of the distance from the screen to the most distant member of the audience. Other authorities consider that a smaller picture (some go as far as one-ninth) would be adequate.

In general a small picture brilliantly lit is preferable

to a larger one with inadequate illumination. At least two foot-candles¹ are required with film of average density to light a picture on a matt white screen. With a bead screen one and a half foot-candles may serve,

Focal Length of Lens in Inches	Distance in Feet From Screen														
	8'	10'	12'	16'	20'	25'	32'	36'	40'	45'	50'	64'	75'	100'	
	Width of Picture														
.64	4'8"	5'10"	7'0"	9'5"	11'9"	14'7"	.....	.....	.....	.....	.....	.....	.....	.....
¾	4'0"	5'0"	6'0"	8'0"	10'0"	12'6"	.....	.....	.....	.....	.....	.....	.....	.....
1	3'0"	3'9"	4'6"	6'0"	7'6"	9'4"	11'11"	13'5"	14'11"	.....	.....	.....	.....	.....
1½	2'0"	2'6"	3'0"	4'0"	5'0"	6'3"	8'0"	9'0"	10'0"	11'3"	12'6"	.....	.....	.....
2	1'6"	1'10"	2'3"	3'0"	3'9"	4'8"	6'0"	6'9"	7'5"	8'5"	9'4"	11'11"	14'0"	18'9"	
2½	1'2"	1'6"	1'9"	2'4"	3'0"	3'9"	4'9"	5'4"	6'0"	6'9"	7'6"	9'7"	11'3"	15'0"	
3	.....	.....	1'3"	1'6"	2'0"	2'6"	3'1"	4'0"	4'6"	5'0"	5'7"	6'3"	8'0"	9'4"
3½	.....	.....	1'0"	1'3"	1'8"	2'1"	2'8"	3'5"	3'10"	4'3"	4'9"	5'4"	6'11"	8'0"
4	.....	.....	.....	1'1"	1'6"	1'10"	2'4"	3'0"	3'3"	3'9"	4'2"	4'8"	6'0"	7'0"

TABLE SHOWING FOCAL LENGTH OF LENS REQUIRED TO PRODUCE A PICTURE OF GIVEN WIDTH AT VARIOUS DISTANCES FROM SCREEN (6-MM. PROJECTORS)

and with a silver screen even one foot-candle may suffice. The intensity of illumination varies, of course, inversely with the square of the picture-width.

¹ The foot-candle is the unit of illumination. It is equal to the illumination at a distance of 1 ft. from a standard candle.

CHAPTER III

THE FILM IN THE CLASS-ROOM

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IN this chapter we shall first deal with some of the fundamental considerations that have to be taken into account and then give examples of methods of using films in lessons.

One of the most important subjects for discussion is the question of the functions of the sound film and of the silent film. This is partly a matter that has to do with the actual content of the film. If films are to be used in the teaching of modern languages it is fairly certain that they would require to be sound films; if historical events are to be represented, some at least would require the spoken word if they are to give a sense of reality. It is also partly a matter of the ways in which films are used; such language films and history films must obviously be shown "straight through" if they are to be used at all. Indeed, any film that must be shown "straight through" may have, and normally will be all the better for having, a sound accompaniment. Where a clear-cut, quick demonstration of facts or methods is the essential object of the film, a spoken commentary carefully thought out to fit the film is obviously more effective than any *ex tempore* comments by the teacher. There is indeed a tendency to think that because this is so there is no place for the silent film in the class-room. This is, however, scarcely true; indeed, the reverse is more nearly the case,

for it is not often that in the school class-room it is desired to have a clear-cut, quick demonstration of facts or methods.

Further, as will appear later, we do know something of the technique of using silent films in the class-room, but we know much less of the use of sound films in the class-room. The writer has seen only one lesson in which a sound film was used, but it required, or at least had, two operators to look after the projector besides the teacher who gave the lesson. In this case a lesson was given, the boys were told to look for certain things in the film, and the film was shown. That in fact seems one of the two methods which may be adopted when sound films are used; the other would be to give a very short introduction, show the film, and then ask questions on what has been seen and heard. There is, in fact, a distinct tendency to encourage the tendency to "say it back" in one form or another.

The function of the silent film in the class-room would appear to be much wider. Most of the advocates of sound films assume that because these came after silent films they must be of more use for class-room purposes; but the sun is no more "obsolete", a word used of silent films, because its light existed before that from coal than are silent films because they existed before sound films; coal gas is not obsolete, though for some purposes it has been replaced by electricity; the value of the sound film in school has to be proved, not assumed. It might indeed be thought that, as it is not likely that technically our schools will ever be able to compete with picture houses to which children go, it would be well to challenge comparison with these as little as possible. It would help

us also if we knew the relative value for teaching purposes of talk on the one hand and captions of various lengths on the other, shown for 1, 2, 3, 4, . . . n seconds or minutes to children of 7, 8, 9 . . . 18 years of age; but when all is said and done it is the teacher who will use the films, and the teacher's opinion is not in doubt. It is significant that while directors of education and those in authority are distinctly favourable to the use of sound films, training college lecturers are more divided, and teachers, especially those who have used films in the class-room, are almost unanimously in favour of the silent film.

The following are some of the reasons for this preference for silent films:

The first is that in the class-room it is the children who ought to do most of the talking, and they have little enough chance as it is; even if they spoke continuously in a thirty-minute lesson each of thirty children could be allowed only one minute. If they have to compete with an unknown commentator as well as with their teacher they will not have much chance of saying anything at all. If there is any value in the film in supplying a stimulus, it is surely necessary that one of the most important results of the stimulus (to children if not to adults) should be given an outlet. The youngster should be allowed at once to put his ideas into his own words.

The second is that in the class-room the children work; they may work and do good work by looking at a film as they work by reading a book; but in so far as the conditions of the two activities are similar, the children are merely having so much information pumped into them; and in so far as they are different it has to be pointed out that the amount of information put before

a child in a minute of film is overwhelmingly greater than that which he can read in a minute; it is just a sheer impossibility for him to take in seven minutes of film in seven minutes even with the aid of a sound commentary. There must be that give and take between teacher and pupil which is of the essence of class teaching. The implication is that the teaching film must be stopped, for if there is one thing that the teacher knows (though it takes a long time for young teachers to learn) it is that he can go only at the rate at which the children can follow; he knows that it is not what the teacher can say in a lesson that matters, but what the pupil can take in; it is not what the film can say in seven minutes that matters, but what the pupil can take in if it is spread out over three-quarters of an hour.

Further, the film must be stopped not only because the youngsters must have time to assimilate the information given in picture form, but because they must have time to think about it and work with it; this is education while the other is only instruction. A good teaching film supplies not only facts but matter for inference, and these matters for inference cannot be left till the end of the film; they must be dealt with as they appear on the screen; to do so the film must be stopped to allow of question and answer, questions by both pupils and teacher. Also the duration of the stop is indefinite; with one class it may be longer than with another; it is thus unsatisfactory to use the device attempted in some sound film projectors of holding the picture for a definite period. The sound commentary is superfluous in this case; if there is to be a commentary it seems obvious that it should be in the form of a caption which may be stopped and studied,

not in the form of a fleeting voice whether of the teacher or another.

The third is that the simplest form of apparatus is necessary in the class-room; the projector and film must take their places with blackboard, models, books, paper, pens, ink, and the other material aids which the teacher uses as subservient to his lessons. It is to the class and to the individuals in the class that the teacher must give his undivided attention, and anything that distracts him from paying that attention must be removed. Even the more complicated forms of silent projectors tend to distract the teacher from his job. With a hand-turned silent projector (which seems to the writer the most desirable to use) one's hand is on the one movable part, the handle, one stops at once when one wishes at precisely the point desired; the action is automatic, without thinking; it just happens; and when stopped there is no noise even of the motor to distract attention. With a more complicated machine, motor-driven, fitted with an instantaneous stopping device, starting handle, reversing switch, and speed regulator there is distraction of attention. With the former machine one regulates the speed automatically merely by turning the handle faster or slower, and it is easy to stop because to do nothing is easier than to do something. In fact, full attention can be given to the class. With the more complicated projector, though the device may stop the film instantaneously, the teacher does not touch it instantaneously; he has to do something, which is more difficult than to do nothing; he has to be on the alert to stop at a precise point, in which case he is not attending to the class; or his hand is holding the speed regulator or is merely by his side

while his eyes have been on the class or the screen; there is a lag between his brain and his hand, he misses the stopping device in the dark and the desired frame goes past; what is worse, he has taken his attention from the class and an unfortunate situation is created.

An experienced teacher has indeed pointed out the desirability of having two members of the staff present when any but the simplest projector is used, for, he says, "one must be able to give undivided attention to the machine". This, of course, is not class-room teaching at all; it is better than nothing, but it will not carry us very far; if the film is to be used as a normal teaching aid the teacher must depend on his own resources and be independent of anyone else whether an outside operator or a member of staff. If difficulties are found with any but the simplest silent projectors it is obvious that a sound machine for class teaching is practically impossible; the projector to be used for ordinary class teaching is the simplest that can be produced, and that is one which will show only a silent film.

There is another condition for success in the use of the film for class teaching and that is that the teacher should know extremely well the film he is using. It is possible in exceptional cases for a teacher to study with a class a film which he has never seen before, the teacher, in fact, becoming for the moment a pupil and trying with the other pupils to see what the film means. But this is not really an exception, for in practice it will be found that if much benefit is to be obtained from such a film it will have to be run through several times. In normal cases the only difference is that the teacher will have to view the

film by himself repeatedly before he uses it in class. Even when notes for the teacher's use are provided much preparation is necessary. If such notes merely indicate what are the facts being shown it will be necessary for the teacher first to relate such description to the scenes shown on the screen, and, thereafter, he has still to decide how he is going to use the material with the particular class concerned. If the notes not only describe the facts but suggest inferences to be drawn from them and methods of use, the film must still be studied intensively to decide how it will be used. It is part of ordinary teaching routine to know thoroughly the material with which one deals in class.

Examples of Lessons.—We now come to the question of actual ways of using films in the class-room. One thing is indeed plain, that there is no "sealed pattern" of teaching film and there is no one way of using it. But this at least may be said, that the mark of a teaching film, as distinct from a background film, is that it must supply material for that give and take which we have pointed out is essential between teacher and taught in any lesson. A geographical film, for example, must of course supply geographical material, but it must not merely supply material to be assimilated, which will at best be tested as knowledge; there must be some original thought on the part of the pupils, some constructive work must be done with the film if it is to rank as a teaching film and the film must supply material for the exercise of this thought. The following examples of lessons which have been given illustrate how films may be used in this way. These examples are taken from geography, as this is the subject

with which the writer has worked, but methods are applicable to other subjects.

First I will take *A Mediterranean Island*, a film with sound comment produced by British Instructional Films, now taken over by Pathé. The island is Cyprus, but the selection of views is made so that the whole film is typical of the Mediterranean lands. It can be used as a background film: it is shown to a class and then, in effect, it is said: "That is the kind of thing you see in Mediterranean lands. Now take out your books and atlases and we shall learn about these lands." Or it may be shown after the class has learned about the Mediterranean lands; that revises what has been learned. It may, however, be used to teach the characteristics of these lands: for this purpose the silent version is more suitable, without any comment even by caption. The essential question is, "What do you see?" (not, be it noticed, "What do you remember to have seen?"). At a particular point the film stops and the question is put. We may get the answer: "People moving under a gateway." "Yes. Is it dark or light?" "Very dark." "And, beyond, what do you see?" "Ah, there it is very light." "What makes it light?" "Strong sunshine." "Exactly."

Or, again, a street scene in a country village is shown and the question asked: "What is there here that we have noticed before?" "Strong sunshine." "What else is seen?" "People." "What are they doing?" "Working." "What are they making?" (1) "Chairs." (2) "——." (3) "——." "Do people work like that in the street in this country?" "No." "What is the difference?" "It is warmer there." Scenes of the typical Mediterranean maquis are shown, and again the pictures are used as the basis for questions

which stimulate observation and bring out the essential features in the geographical conditions of the Mediterranean. It must be noted that, for such work, it is necessary to stop the film; it would be impossible to have such questions and answers while the film ran on and scenes were shown other than those being dealt with.

Here there is at least some attempt at inducing thought, and the film may be gone through section by section, making sure that the necessary points have been made. Generally, when a film is used in this way it must be short and, as a matter of fact, the *Mediterranean Island* is rather long for detailed treatment of this kind.

But the film may be used in another way—as a test. I have taken a class, usually a fifth or sixth form, who have studied the world, and introduced the lesson by saying: “I am going to show you a film of a small area, and at the end I wish you to tell me as nearly as possible where it is and why you think it is there.” As it happens, some maps are shown at the beginning of the film which help to elucidate the position and the characteristics of the island. In using the film in a test I have, of course, masked the projector till this section is passed. It is, however, more than a test; it ensures hard thought, work is done and the results show that the work is of a kind suited to that particular age and capacity: for pupils who have been adequately taught geography have nearly always identified the scenes as having been taken somewhere round the Mediterranean (though only one has mentioned Cyprus) and could give reasons for their decision. On one occasion when I found that the class had seen the film previously I changed the form of introduction to “I know you have seen this film before,



[British Instructional Films]

SCENE FROM "A MEDITERRANEAN ISLAND"
(See Chapter III)

but I wish you at the end to give as many instances as possible which show that Cyprus is a typical Mediterranean region." Again the results were entirely satisfactory.

A film which was used in another way was one on the Eskimo, rearranged for me by Mr. Gill from a film with that title in Pathé's 9·5-mm. list—of course silent. This was used with junior classes of capacity equivalent to Standard III, and at first I kept the original captions, but they were not easy for young children to understand and I had them cut out. Instead of these I supplied the children with typewritten sheets with captions in words of one syllable and between each scene lights were turned on, the appropriate caption read, its meaning discovered, and the scene shown; stops being made for further discussion. Here the main use of the film and question was to stimulate observation of facts. Incidentally, it may be noted that this method supplied reading matter which the children saw a reason for reading and wished to read. At the end the film was shown all through without a stop, taking about three minutes, this revision being a very important part of the procedure. The whole lesson lasted for about thirty or forty minutes.

Mr. W. H. George contributes another example on Physical Geography.

The teacher says: "I am going to show you a little film, it is about the sea-coast and the waves. I want you to look and watch carefully."

There is the title and then there are scenes of a windy day, and a stormy sky. Then a caption, "The winds make the waves." The film continues with scenes of waves showing the up and down movement: it shows the waves

breaking on the sea-shore. The flow of the tides and the wind brings the waves in contact with the land. The waves topple over and dash against the shore. The film shows the sea-coast being worn away and the various devices erected to protect. The film continues by suggesting that material worn away is carried by current to other parts and so the land is built up. Examples of this are given; there is the Wash and Chesil Beach.

Now as this film is correctly made no class should fail to grasp the main theme. So, when the film has been shown, the teacher ascertains whether this main theme is grasped.

Then there is a discussion. Questions are asked and various points raised.

Some parts of the film are shown again and stops made. The movement of the waves and the breaking on the sea-shore could be shown several times.

When all the points have been cleared up there may be time to show the film right through again.

In the case of this film questions are asked at the end. For example:

1. What causes the waves?
2. When and how do the waves cause damage?
3. Draw a sketch of a breakwater.
4. What happens to material worn away by the sea?
5. What parts of the English sea-coast are being worn away?
6. What parts of the English sea-coast are built up?

Another method was employed with a film, very kindly cut down for me by Kodak, Ltd., from that 16 mm. entitled *Corn*. In its original form it takes about a quarter

of an hour to show. This is much too long for a teaching film to be used in one lesson. When abbreviated it can be run through in seven minutes. This lesson has been given once to Form IV in a Secondary school and several times to different Standard VI classes, each of which had been studying North America and had "done" the wheat belts and the cotton belts but had *not* studied the maize or corn belt.

The lesson is begun by showing a wall map of North America and asking some revision questions on the location of the cultivation belts which the class has already studied, and on the general relief and climatic conditions in the Continent which they have learned. This ensures that there is some definite background basis for the work to be done. Then some maize seeds are distributed to each member of the class and they are asked what these things are. The unanimous opinion of such classes as I have taken—in London—has been that they are "chicken food", but they have been prepared to accept the name "maize". Then I have said: "I am going to show you a film showing how this chicken food or maize is grown, and at the end of the lesson I am going to ask you to tell me from what you have seen as nearly as you can *where* in North America it is grown, and why you think so."

Then the film is shown section by section, questions are asked with the object of making sure that what is shown on the film has been seen and that the implications are understood. (Perhaps I might here interpose the remark that in my experience children do not see nearly so much in a film as they are sometimes supposed to do.) Farm processes, e.g. "ploughing", "planting", "cultiva-

tion", usually mere names to the children, are given a connotation: the children see the clever way by which the soil is turned over by the plough, the immense trouble to be taken in breaking up the soil and preparing a fine tilth for the seed, the methods of sowing the seed, the implements used, the distance between the rows very different from that between rows of wheat, the appearance of the maize at different stages of growth and while it is being cultivated, all these are shown and the important lesson learned, without anything being said, that the farmer's life is a busy one. The film must be stopped frequently to make sure that the obvious facts are seen and discussed; for example, the reason for cultivation may be considered, i.e. to allow of air penetrating the soil so that bacteria (probably called "germs") in the soil may be able to fix the nitrogen (probably paraphrased as something simpler) in a form that can be used by the plant.

Further, all these facts are shown against a background which is a typical part of the maize belt of North America at different seasons of the year. The flatness of the land is obvious, trees surrounding some of the fields are in leaf, the summer heat suggested by the luxuriant growth of the plants is evident from the clothing worn by the workers. From the caking of the soil, which makes necessary continuous cultivation, can be deduced the fact that rain is frequent, while the fact that it is intermittent is suggested by the clouds of dust that rise when the cultivator breaks up the soil. This all gives material which may be used when the final question is put: "Where is maize grown?" The height of the maize stalk at its full growth is compared with the height of a man when he

comes to examine the cobs. Then, with the appearance of these on the screen, lights are switched on and a real maize cob, dried of course, is exhibited together with part of the stem and some leaves. The arrangement on the cob of the grains of maize, like those on their desks, is noticed by the boys and the immense number of grains grown from one that was planted always arouses intense amazement. When the film is resumed harvesting is shown; here, as an accompaniment to the various operations, the very great cold is obvious, not only from the leafless trees and the snow on the ground but from the warm clothing worn by the men engaged in the work.

While the film is reeled back the class writes the answer to the question "What are the geographical conditions under which maize is here grown?" They have noticed the rain and dust and snow, the changes in the trees and in clothing; these have told their own story and supplied a basis for an answer to the question. The different answers are then discussed with reference to what has been seen and finally the reel is shown again and the pupils asked to write the answer to the question originally propounded. The preliminary map work, the observation of the film, and the final discussion of the conditions under which maize is grown have supplied material for at least an informed guess at a sensible answer. In the case of the Form IV in a secondary school the answer of almost every boy was that "maize grows between the wheat belt and the cotton belt", and definite reasons given. In the case of several classes equivalent to Standard VI in a Senior school the answers were not so unanimous, but the results made it clear that things had been seen

and not merely looked at and that original thought had been evoked from the great majority of the boys.

It is obvious that work of a similar character could be done with other films in other subjects, physics and chemistry, history, and hygiene. Indeed, it might be said that work could be done with the same films in other subjects; it is pretty certain that with a different emphasis and a different trend of questioning the "corn" film might very well be used as the basis of a botany lesson. Films also supply excellent material for oral and written work in English composition; so much of such English work consists merely of a repetition of other people's words; a description of a silent film without even captions must be given in suitable words which have not been supplied by other people, and the difficulty which children find in choosing the right words is evidence not only of the fact to which reference has been made above that they see much less in a film than they are generally supposed to do but of the need for such work. In mathematics short strip films with ends joined to form a loop (see Chapter I, p. 17) and run through continuously are extremely useful in supplying material which vitalizes lessons and enables the pupils to understand what the teacher means.

In conclusion, the fact must be emphasized that though it is at last realized that the film is useful in the classroom we have hardly begun to discover the many ways in which it may be used in teaching.

NOTE

By W. H. GEORGE

William Rhodes Modern School, Chesterfield

The fields of the film in the class-room may be set out as :

1. Mainly background; suitable for revision after a series of lessons.
2. Background; to open up a new field of study.
3. Deliberately instructional; the film expounds a lesson centred round a main theme.
4. Deliberately instructional; strips of instructional matter.

It is important to remember that all films should be viewed first by the teacher. Even when notes are provided with the film this preliminary pre-view is essential. During this show the teacher will soon ascertain the type of film and its content. He will see whether some study is necessary on his own account although this may be avoided by sensible notes with the film. The teacher will decide the time to be allotted to the film and also whether the film is too long to be shown in its entirety. This last point is important, as there is considerable temptation to show the film right through when it obviously contains too much matter.

In the case of background and revision films there is less danger, as these films may be shown on various occasions throughout the school year. Take the case of a film of animals throughout the world—this may be quite a simple geography revision film; it might be shown several times and each time there may be something new grasped.

Even when notes for teachers are prepared for use with the film a pre-view is necessary. The teacher will find that background films for one class will be instruc-

tional films for another. Most teachers on seeing a film will readily assess its value and its teaching points.

It is highly probable that the teacher's own films and film strips will be the best, as the teacher will be familiar with the material and see that it serves his aim.

With regard to sound films and educational talking pictures, when these are successful, as in that fine background film *Weather Forecast*, the film should stand on its own as an authoritative contribution. There is no doubt that such a film has immense value. So many talking pictures are, however, merely "commentated" silent pictures. In cases where this commentary is not good it is advisable to shut off the sound and carry on with your own comments, that is, where the material is worth it.

It must be borne in mind that the silent film is of the greatest service and value, and teachers must strenuously press for the film material that serves their needs.

Incidentally, it should also be remembered that classes do not readily learn to see. In time and where the film is used regularly, the technique of seeing improves immensely.

Finally, the main points which determine the successful use of the film in the class-room are:

1. Perfect arrangements for darkening the room and operating the film.
2. The projector to have—
 - (a) Reverse and loop device.
 - (b) Still picture device.
 - (c) Quick rewind.
3. Full preparation, pre-view of film by the teacher.
4. Adequate follow up of the film lesson.

CHAPTER IV

THE MASS DEMONSTRATION

BY CAPTAIN G. D. GRIFFITH, M.B.E., B.Sc.

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THE phrase "Mass Demonstration" is understood to imply the showing of films to school children in the public cinema, by the standard projector and sound apparatus used for general public entertainment.

It is certainly not advocated as a substitute for the sub-standard projection of teaching films in the classroom. This latter method of film display is needed in all schools and the time will doubtless arrive when every school will possess its own projector and will have access to a suitable library of teaching films. Even then the Mass Demonstration will play an important role in the scheme of visual education, because the two forms have uses which are distinct from—though allied to—each other.

The question of cost is important. A considerable time is likely to elapse before sufficient capital expenditure is incurred to supply every school with projection equipment. Furthermore, the provision of suitable projectors and of electric power to supply adequate illumination, the adaptation of class-rooms as dark rooms, the necessary improvement of the ventilation of rooms not originally designed for use as dark rooms and the provision of adequate libraries of films all necessitate an expenditure of money which many education authorities consider, whether rightly or wrongly, could be more advantageously disbursed in other directions.

The immediate adoption of Mass Demonstration tech-

nique might thus lead to a saving of money. It would certainly lead to a more rapid use of the film as an aid to education.

Public cinemas are generally unoccupied in the mornings. It does not seem unreasonable to make use of them, when they are not being used for public entertainment, for the showing of educational and background films to children attending schools within reasonable distance of the theatres. The cost will depend, to a large extent, upon the arrangements which can be made with the proprietors of the cinemas. In practice it has been found that a charge of one penny to threepence per head of the audience attending will meet the whole of the expenditure involved. This means that for an average audience of 1,000 children and adults-in-charge the expense of hiring the cinema and the films will vary from £5 to £15 and should be nearer the minimum than the maximum figure.

Thus, if only for financial reasons, Mass Demonstration is likely to be the main avenue of film education for the majority of elementary school children for some time to come. While the teaching film, as such, can be shown at the public cinema, it is undoubtedly more suited to the technique of the sub-standard projector and to the classroom. The background film, which is suitable for large audiences, is better for Mass Demonstration.

The public cinema, even where the worst projector and sound apparatus are installed, has advantages in the quality of the picture shown (not in the subject-matter), and in the comfort and hygienic conditions of a building specially designed for its purpose, as contrasted with the sub-standard projector—even of the most advanced and

expensive type—used in improvised dark rooms in the school.

Much criticism has been levelled against the type of film which children are allowed to see in the programmes usually provided in public cinemas, but it must be admitted that, even where the subject-matter is in question, quality of projection leaves little to be desired. If the standard of projection and the quality of production of educational films shown in the schools are inferior in quality to what the children see even in the worst public cinemas, they are likely to be unfavourably impressed by display in school.

It is certain that the use of the class-room projector, even in its crudest form, can be of immense assistance to the teacher. Yet taste and artistic appreciation, essential elements of a liberal education, can at present be best cultivated by the Mass Demonstration. As the report on *The Film in National Life* puts it: "The taste of the next generation is largely formed at school; therefore the schools cannot afford to neglect so important a factor as the film in the education of a generation which goes regularly and naturally to the cinema. But it is in the public cinema that the film has its strongest hold and national interest and, therefore, its greatest cultural and social influence notably on children and adolescents."

Films suitable for Mass Demonstration.—In the St. Pancras experiment the Committee of Head Teachers spent many hours viewing films, and their conclusions are interesting as controverting the statements so often made, especially, by those who rarely see any films at all, that there are so few films suitable for showing to children.

"It has already been pointed out that there is available a considerable choice of films suitable for illustration of certain subjects, but it is evident:

(1) That there are only certain subjects in the curricula for which, at present, films suitable for Mass Exhibition are available mainly, Geography, Elementary Biology, and Nature Study.

(2) That the majority of the existing films which were not produced as teaching films are, nevertheless, suitable for Mass Exhibition, although they could be greatly improved from this standpoint at comparatively little cost by minor additions such as maps to travel films, dialogue to other films, statistical pictures to many, and by making composite films from existing material.

(3) That the films already in existence can supply, in many subjects, the background, which can be obtained in no other way. This is specially important, as it is a new aid to the teacher which has never before been available. The testing of this phase of education by film requires exploration and no satisfactory method has as yet been suggested. It is a point which might be usefully borne in mind for experiment in future film exhibitions to children."¹

One of the explicit aims of the St. Pancras experiment was "to discover to what extent it is already possible to obtain films bearing definitely on the current work of the schools".

For this purpose a form of questionnaire was sent to the Head Teacher of every department sending children, asking for particulars of topics in various subjects of the curricula of the schools which would be taken during the period of the experiment and which would be suitable for illustration by film.

¹ Report of the St. Pancras Experiment. (L.C.C., privately circulated.)

ST. PANCRAS SCHOOLS EDUCATIONAL FILM MATINEES. 1933-34.

SCHOOL _____

DEPARTMENT _____

Please indicate the topics which you consider would most suitably illustrate the undermentioned subjects in your curriculum during the period from November to March. The age groups may be combined to suit your classification or convenience.

Age Group	No. of Pupils	History	Geography	Elementary Science, Biology, Nature Study	Hygiene, Health	Handiwork, etc.	Literature	General
10 to 11								
11 to 12			--					
12 to 13								
13 to 14								
14 to 15								
15 to 16								
Over 16								

FORM CIRCULATED TO HEADS OF SCHOOLS TAKING PART IN THE SCHEME

From the replies received it was possible to compile a list of films which would suit the various age groups and which would illustrate the current work in the schools concerned.

Preliminary Work.—In order to use the film display most efficiently a certain amount of preliminary work with the children is essential.

The films selected for the demonstration may include those dealing with History, Geography, Nature Study, and Biology, together with other films of a general nature which may be styled "background" films. With the exception of the last category, all the films will be used to illustrate or to recapitulate the lessons which have been given in the class-room in these subjects. Thus in a film such as *The Scarlet Runner* (produced by British Instructional Films and distributed by Pathé) it will be possible to illustrate the growth of the bean from planting to fruiting in the space of ten to fifteen minutes. If the children have had no preliminary instruction they cannot be expected to follow the whole of the story illustrated on the screen and some sort of special instruction is also indicated if the full value is to be obtained from the exhibition.

The film referred to is a "talkie" and it is advisable for the teachers to be acquainted with the narration before the visit to the cinema is made and also to see the film if this is practicable. It is pointed out in the report on the St. Pancras experiment that it would be valuable if the film-producing companies issued a brochure with notes on special points to be emphasized and hints to the teachers to clarify certain points of the narration or of

the picture. This has been done by some of the companies. In addition, it was suggested that pictures or "stills" from the actual film would be very valuable for preparatory work in the schools before the exhibition and for recapitulation in the class-room after the films had been shown in the cinema.

It will be noticed in the programme of films given in NOTE I at the end of this chapter that many of the selections made are in the nature of typical Geography, etc., films which are, to a certain extent, revision or amplification of subjects appearing in the syllabus.

NOTE II is a shortened form of the questionnaire which was given to the 12,000 children who attended the cinema in the St. Pancras experiment. It was worked by the children in their schools immediately after the exhibition. While this form of test is open to criticism, it was thought to be better than any other for the purposes of the experiment.

This form of follow-up test may be considered suitable for certain films and seems to be of the type which should be developed for the testing of that background knowledge which has not yet been tested in any satisfactory way.

TECHNIQUE

The Preliminary Organization.—It is clear that the organizers will need to know the requirements of the district with regard to the material to be shown.¹ It will also be necessary for them to obtain from the participating schools particulars of the numbers of children in the various age groups.

¹ Cp. the questionnaire on p. 77.

Where reorganization has been more or less completed, it will usually be found possible to arrange exhibitions for at least three different sections: Junior Departments, Senior Departments, and Selective Central Schools.

The public cinema will usually accommodate about 1,000 children and teachers. It will facilitate arrangements if the schools within walking (or easy travelling) distance of the cinema are included in the scheme, but it must also be borne in mind that the audience should consist of children of approximately the same age-group if the best results are to be obtained.

There are regulations in force in all districts with regard to fire precautions for audiences consisting principally of children.¹ The organizer will need to have full cognizance of these rules and must make himself personally responsible for carrying them out. It may be possible to arrange with the proprietors of the cinema for a reduced hiring fee if the school organization provides the number of attendants required by the bye-laws. These teacher-stewards must be trained in "Fire Drill", and this can usually be done half an hour before the exhibition.

In most cinemas, pay-boxes and entrances are much fewer in number than the total number of exits which can be used in case of emergency. As no payment for admission will be made at the pay-boxes it will be found convenient to use entrances *and* exits for groups of children because of their proximity to the block of seats to be occupied. The children can then use as exits, at the end of the performance or in case of emergency, the door by which they entered to reach their seats.

¹ Cp. footnote, p. 38.

The seats in the theatre having been allocated to the groups of children from the various schools, it will be found simple to issue a group ticket giving the name of the theatre, the date and time of the performance, the name of the school, the group attending, the rows and seats to be occupied, and the entrance. This ticket should have a distinctive colour for each entrance used and a

CAMDEN HIPPODROME	
Date_____	10.15 a.m.
SCHOOL_____	
GROUP No._____	
Grand Circle	Row_____
	Seats_____
ENTRANCE FRONT RIGHT	

EXAMPLE OF TICKET ISSUED TO PUPILS

large notice card (15 in. by 20 in.) of the same distinctive colour as the group admission card should be exhibited prominently at the entrance concerned. The children should be instructed to leave the theatre by the same door as they entered.

Most cinemas are now provided with separate tip-up seats, and if a seating plan cannot be obtained from the management the organizer would do well to prepare one with the rows lettered and the seats in the rows numbered, as is the usual practice in the booking plans of theatres.

After allotting seats to the individual schools, it is advisable to send a copy of this seating plan of the theatre to each of them, showing the position of the seats to be occupied by its children. This should accompany the coloured admission card mentioned above. It was found that, by using this method, the children were assembled expeditiously. They were marshalled to their seats with a minimum of effort and the theatre was cleared at the end of the performance in a few minutes, with complete absence of confusion.

The order of the programme can be varied according to the wishes of the organizers, but it will be found that, under ordinary circumstances, one hour is long enough for the average Mass Demonstration.

If longer, it becomes a strain on the attention of the children, especially of those in the younger age groups. A shorter programme is not deemed advisable in view of the trouble and time involved in organizing the exhibitions. An alternative plan is to show the pictures to several audiences on the same morning.

While the audience is assembling, a suitable programme of music (e.g. by gramophone records) can be given. A few words in the schools concerning the music to be played is advisable or an explanation can be given through a loud-speaker. It was suggested in the report of the St. Pancras experiment that this part of the programme is capable of development. For instance, in a district where a Schools Musical Association is in existence, an orchestra might give a short selection of suitable pieces.

When the assembly is complete it is advisable that some announcement be made to the audience in explanation of the objects of the demonstration. If some

form of experiment is being conducted in connection with the showing of the films the details can with profit be explained to the audience. It should also be pointed out that the information gathered from the showing of the films will be tested afterwards. This, to some extent, differentiates the demonstration from the usual entertainment visit to the cinema. It does not detract in any appreciable measure from the children's pleasure in this novel form of lesson.

In the St. Pancras experiment the first film was the one selected for the testing of the talkie narration as compared with the teacher narrator. This film took about 25 minutes to show.

After the first film, the lights were put on and a visitor was introduced to address the children. This was found to be a useful break and, also, it gave the children an opportunity of hearing and seeing a well-known person. There was a certain amount of difference of opinion as to whether an outside visitor should be introduced, but it may be noted that this forms a suitable opportunity for making one of those outside contacts which many consider are at present too few.

Effect on the Children.—There is some conflict of opinion as to whether films, and especially "talkie" films, tend to make children passive absorbers. It has been urged that the radio and the gramophone encourage children to become mere listeners, purposeless and careless. Similarly, it has been maintained that, at first, children observe educational films attentively, but that as they get more used to them indifference grows because *active* employment is not provided.

This criticism was not borne out by the deductions from the answers to the questionnaires given to groups of children after they had viewed films. For example, *Bottled Health* was shown and the questionnaire¹ was then answered by all the children who had seen it. It was also answered by two other groups, of which one had not seen the film but had had the narrative read to them, while the other had had neither of these advantages.

There were thus four different groups of children to be tested :

- (a) Those who had neither seen the film nor heard the narration ;
- (b) Those who had not seen the film but had heard the narration ;
- (c) Those who had seen the film with "talkie" narration ;
- (d) Those who had seen the film, accompanied by teacher-narration.

There was an advance in the percentage of correct answers progressing from A to D. The children who did not see the film did worse than those who saw it. The children who had the teacher-narrator with the film did best of all.

It would appear that the best results will be obtained from the use of the film accompanied by the teacher-narrator. There are several points which emerge in connection with this form of film instruction :

- (a) The teacher-narrator is superior to the "talkie" narrator as now supplied with the films available ;
- (b) The scenario and other information, collected in

¹ See p. 77.

the form of a teacher's text, would be a valuable asset to the narrator in the preparation of his dialogue;

(c) The teacher-narrator can vary his dialogue in form and style to suit varying age groups;

(d) The microphone and loud-speaker are a great help in narrating to large audiences;

(e) The teacher-narrator's dialogue can be made a very useful pattern of correct speech.

The Follow-up Work.—Reference has already been made to the testing of the children after they have seen the films. This may be done in the class-room either by oral questioning, by composition, by specially prepared questions requiring short answers and covering the whole of the subject-matter, or by a questionnaire.

Each form of follow-up work has its uses and can be employed at will.

For the purpose of obtaining definite statistics as to the value of the particular film shown, or for other research, the questionnaire form is the easiest both for correction and for classification.

To obtain the best results much careful preparation is needed. The teachers responsible should have opportunities of viewing the film several times, and it will be found advantageous to allow some of the older children to view and assist in preparing the questions.

It is again noted that films, specially chosen, can be a very useful medium for revision purposes and to review in a short time courses of lessons in Geography, Nature Study, and other subjects.

NOTE I

ABRIDGED PROGRAMME OF MATINEES SHOWING AGE GROUP, FILMS SHOWN, AND TYPE OF NARRATION

No.	Type of School	Age Group	Title of Film	Description	Narration
1	Central		<i>Bottled Health Contact</i>	Hygiene Science and Geography Development of Aircraft—Imperial Airways	"Talkie"
2	S.B.	11-12	<i>Bottled Health Life of the Frog Rails and Trails</i>	Hygiene Elem. Science Geography—Railway construction in Africa	"Talkie"
3	S.G.	13-14	<i>Bottled Health Life of Nightingale Southern April</i>	Hygiene Nature Study Geography—Fruit culture in South Africa	"Talkie"
4	J.B.	10-11	<i>Bottled Health Springtime at Zoo Southern April Life of the Frog</i>	Hygiene Nature Study Geography—Fruit culture in South Africa Elem. Science	Narrator
5	S.B.	13-14	<i>Bottled Health Eastern Gate Crasher Conquest of Air</i>	Hygiene Geography—Motor journey from Persia to India History of Flying from earliest times	Narrator

NOTE II

ABRIDGED QUESTIONNAIRE

AGE:.....years.....months. SCHOOL:.....

Questions on the Film "Milk"

INSTRUCTIONS.—Read the questions set out below, and underline the best answer to each.

Here is an example:—

The milk bottles when filled were

- (a) Placed in the sun.
- (b) Packed carefully in a hot oven.
- (c) Put in a cold store.
- (d) Put in a steam chamber.

(c) Put in a cold store has been underlined because it is the best answer.

NOW BEGIN.

1. The animals with horns shown in the picture were
 - (a) Goats.
 - (b) Rams.
 - (c) Cows.
 - (d) Buffaloes.
2. The greatest number of cows in England belong to
 - the breed
 - (a) Ayrshires.
 - (b) Friesians.
 - (c) Kerries.
 - (d) Shorthorns.
3. This breed has become most popular as a dairy breed because the animals
 - (a) Produce better hides.
 - (b) Are beautiful in form.
 - (c) Produce both milk and beef more profitably.
 - (d) Are more hardy.

8. Light and air

- (a) Are essential to the health of cows and for milk production.
- (b) Will not affect milk production greatly.
- (c) Are not necessary for milk production.

9. The floor of the modern cow-shed was

- (a) Made of wood.
- (b) Made of earth.
- (c) Made of concrete.

13. Cows are milked generally

- (a) Once a week.
- (b) Every day.
- (c) Every other day.
- (d) Only when you want milk.
- (e) Twice daily.

14. The men who milked the cows

- (a) Washed their hands in the milk.
- (b) Did not wash their hands at all.
- (c) Carefully washed their hands in water and dried them before milking.

18. The hair was clipped from the udders, and hind-quarters of the cows

- (a) To make the cows more comfortable.
- (b) Because the hair was required for sale.
- (c) To improve the look of the cows.
- (d) To make it easy to clean the cows before milking.

19. When the cows were brought in to be milked they were

- (a) Treated roughly.
- (b) Driven hurriedly.
- (c) Treated gently and not hurried.

25. Men milk into the pails.
 - (a) All the milk except the first few drops.
 - (b) All the milk.
 - (c) All the milk except the last few drops.
26. The concentrated food was dealt out to the cows.
 - (a) According to the weather.
 - (b) According to their appetites.
 - (c) According to the amount of milk they produced.
33. Most milk per person is used
 - (a) In the United States of America.
 - (b) In Canada.
 - (c) In Great Britain.
 - (d) In Sweden.
34. In all the countries compared, the population of England consumes per head
 - (a) More milk than any other country.
 - (b) About the same quantity of milk as any other country.
 - (c) Less milk than any other country.

CHAPTER V

FILM-MAKING AT SCHOOL

By RONALD GOW, B.Sc.

Late Assistant Master, Altrincham Grammar School

IT has already been pointed out (p. 28) that the cinema can be used in the school in two distinct ways. Not only can films be shown to the children, but in many schools it will be found possible for the teacher and his pupils to produce excellent films co-operatively.

To the teacher, such an idea offers many advantages. In the first place, school text-books are, naturally, written by teachers—whether they practise in schools or universities. It is not unreasonable to suppose that the educational film of the future will also be written—or even directed—by teachers. Experience in amateur production will assist those who desire to write for the educational screen.

In the second place, the whole technique of using the cinema as an aid to education is still largely in its experimental phase. There is no doubt that progress in this direction will be greatly helped by the personal research of teachers in the new medium. The actual designing and putting together of an experimental educational film may carry the school cinema movement very much further than years of commercial and professional work which is unrelated to the problems of the class-room.

It is obviously desirable that the teacher-producer should have a natural aptitude for photography—that mixture of the scientific and artistic temperaments which is the basis of a good picture-sense. But it will be quite

unnecessary for him to attempt direct competition with the professional. The latter can give us a perfection of technique which the amateur is unlikely to equal. Nevertheless, the real teacher can give the fruit of his own experience and, if he has a working knowledge of cinematography, will find himself in a position to offer real, constructive criticism to the professional worker.

To the children, the production of cinema films will appear as a new and interesting school activity, in which it is a delight to co-operate. Nor will it be difficult to find subjects. Photographing school functions—speech days or prize days—or the exciting incidents in a cricket match, or the final of the 100 yards race are obvious possibilities. But quite apart from this mere recording function of the camera, it will be found that nature study, laboratory experiments, microscopic work, and the speeded-motion photography of slow growths are all within the range of the amateur.

As a basis for a school journey an expedition with a cinema camera is unsurpassed. Pictures of our own countryside, with a real geographical or social value, can be made on these expeditions. Documentary films of the life of the people, or of industrial or agricultural processes, can be of amazing educational value to a group responsible for their production and, given the very best conditions, might easily have a value outside the school where they are made.

Or a school production group might become more than ordinarily ambitious and attempt a film with human actors. Perhaps the subject might be a reconstruction of some historical event—or a scene from the lives of primitive people. It might be a mere cinema record

of the activities of the school dramatic society or, on the other hand, the business of writing and acting screen plays can be explored. As will be shown later there is in all these phases of the activity an educational "value" which will justify an apparent trespass into the school world. Just how necessary this value is must be carefully considered by individual schools or teachers, who will weigh against it their particular circumstances, the state of their finances, and their willingness to part with a little more of their own spare time.

It should be pointed out that in the foregoing brief summary of the possibilities of cinematography as a school activity nothing has been suggested which has not already been achieved by teachers working in co-operation with their pupils. Mr. W. H. George, of Chesterfield, whose work is now so well known, began his experiments with studies of sheep-farming and of the steel industry, using the production of the film as a motive for a school journey. Among my own earlier attempts in educational film production was a speeded-motion study of the sundew plant, with no more elaborate apparatus than a "Bol" standard cinema camera. I remember that the lens extension tube was an old Pears' shaving-stick holder. One does not wish to challenge comparison with the beautiful film of the sundew made later by the *Secrets of Nature* producers, but one can at least claim that our reel was quite good to look upon, and was the basis of hundreds of nature lessons. Moreover, and this is a point which can hardly be over-stressed, the value to the group making such a film, with all the care, discipline, team-work, and research which even so simple a film demands, is perhaps the strongest recommendation that

can be offered for the making of films as a school activity.

In the same way the production of a film out-of-doors of, say, some local geographical subject, demands careful organization. I mean that a teacher who goes out with a camera, followed by a more or less interested party of young people, and appears to do all the work himself is not really making the most of a fine educational activity. It is possible that most of the responsible work *will* fall upon the teacher, but if he will so organize his party that each appears to have a definite share of the responsibility, the educational value of team-work will soon be apparent. The point need not be laboured: we are all familiar with the guile and cunning which are part of the teacher's equipment!

The wise teacher, too, will be careful to keep the right smack of adventure about his expeditions. A well-conceived, well-organized film expedition offers immense possibilities. A few years ago we decided, at the Altrincham Grammar School, to make a film study of the River Dart as an extra activity at our school holiday camp in Devonshire. Some months beforehand a group of pupils was set to work on a study of rivers in general, and of the River Dart in particular. The river was studied from every angle. Its geographical origins and behaviour were carefully charted. Its social and economic importance were investigated, and a mass of material concerning its literary and legendary associations was very soon collected. Then a rough scenario of a one-reel film was prepared, in which we tried to regard our river film not so much as a local scenic record, but as a study of a type of English river. Every pupil who took part in the various expeditions was provided with a background

and a stimulus to his interest. Naturally the work was done in close co-operation with the school geography expert. It is hardly an exaggeration to say that, when the time for making the film arrived, every member of the party was prepared to lay down his life for the success of the film, a calamity which was happily and strenuously avoided.

There is an amazing amount of work involved even in so simple a film. Apart from the technical work of the camera a dozen or more assistants can be kept fully occupied if everyone is made responsible for some definite job. The production of our film began with an expedition to the wildest and most inaccessible part of Dartmoor, for the filming of the source of the river. Dartmoor ponies were hired for carrying our cameras and camping equipment. (We were using a standard-size professional camera.) The middle course of the river was more easily reached by daily expeditions from our base, and finally we were lent motor-boats and a tug-boat, for photographing the tidal stream and the harbour. One need hardly emphasize the scope for youthful enthusiasm and adventure.

A point about the camera may be raised here. Later in these pages will be found a note on the different sizes available. Without question the writer advises a choice of one of the sub-standard models for amateur work of this kind. Why, then, have I used a heavy standard professional camera in my own work? The expense, of course, is very much greater than with the sub-standard model. But we were able to cancel out the greater expense by renting the films we made to local picture theatres (indeed, in one case to picture theatres throughout the

country), so that by reason of an outside interest in our work we were able to meet the high initial expense of standard film. Subsequently it was possible for us to have sub-standard reductions made of our standard size film. Although I do not advocate the full-size film for every amateur, I should like to place on record that the use of standard apparatus is not beyond the amateur worker who is sufficiently ambitious.

I think perhaps that to tell briefly in these pages the story of the films that were made under my direction at Altrincham is the best introduction I can offer to the school-teacher who intends to do similar work. The motives we had, the problems we faced, and the advantages we gained will be more clearly understood if they are seen in relation to an educational experiment which developed through a period of six or seven years. If I say that now, looking back on those years of experiment, the films we made are hardly worth the celluloid on which they are printed, it is with no feeling of despair. The real and intended value of the work was to those who carried it out. Two of the historical films were used in the widely known research conducted by Dr. Frances Consitt into the value of films in History teaching. In the report of that research a great deal of valuable criticism and comment on our two films, *People of the Axe* and *People of the Lake*, will be found, together with the experience of teachers who showed them to classes, and the results of tests made of their educational value. But I am proud to say that the experiment, although I have been unable to devote further time to it, goes on in other schools; largely as a result of our example at Altrincham.

Apart from some early films, which had been mere

records of school activities, our first ambitious effort was made in 1926, when we decided to make a film of primitive life and to act the parts ourselves. As with most of our films it was designed to provide an activity at the school summer camp. The advantages of weather and scenery, together with the fact that all concerned were, in a way, living under one roof, will at once be apparent. The summer term, with its light evenings, was devoted to preparation. Although our chief motive was to make the *work of production* educational, we, the elders, always kept in mind that we were making an experimental teaching film as well.

We decided to make a one-reel film (about one thousand feet of standard film, lasting, at the old "silent" rate, about fifteen minutes) which would illustrate a day in the life of a boy in the Neolithic period. I think the total cost of the film was in the neighbourhood of £30, including the printing of one positive copy, but it should be kept in mind that, with the modern sub-standard apparatus, the same thing could have been done for a fraction of that cost. We were fortunate to secure the interest and advice of the late Sir William Boyd Dawkins, F.R.S., who overhauled our scenario and made valuable suggestions. Visits were made to museums and the period was dealt with throughout the school as thoroughly as the "real" school work permitted. Costumes were made from sheep-skins and old rugs. Simple properties, such as stone axes, beads, and pottery were made carefully to design.

· As the camp was in Dorset the interest aroused in the period received a further stimulus when the boys discovered that they were in a place actually inhabited at

one time by the people they had studied. Our only built "set" consisted of a few simple huts of the pit-type, which were erected on the camp ground. We soon found that the making of a film is an occasion for resourcefulness. For example, we wanted to make a picture of Neolithic men landing on the sea-shore from their dug-out canoes. To make a real dug-out was clearly impossible, although one boy did set optimistically to work on an old tree-trunk with a Scout axe. Another boy solved the difficulty by borrowing from a farmer a number of iron sheep-troughs. They floated and the landing scene was quite a success—as a "long-shot".

The variety of interests in film-making is its chief charm and value. During the making of the *People of the Axe* film our boys borrowed, and were responsible for, a flock of sheep, a horse, some dogs, some goats, and other domestic animals which could be admitted to the Neolithic period. The question of accuracy, and the avoiding of anachronisms, calls for some hard thinking, particularly in a period of which we have no real picture. In difficult cases we examined the practice of Red Indian or African tribes and made our reconstruction by a process of deduction.

As an example of a simple story, *People of the Axe* would be worth re-making by others. For that reason I give here the full story, not in the form of our original scenario, but as seen by an investigator in the Historical Association research.¹

People of the Axe. A short, one-reel film acted by the boys of the Altrincham County High School (now

¹ Dr. Consitt's inquiry, p. 135.

"Grammar School"). It gives a picture of life in the New Stone Age.

Sources suggested: Immigration.—The film opens with a title, "The Professor digs," and shows a Professor of Archaeology and schoolboys of to-day excavating a long barrow on a hillside. A skull is found and examined, and "an axe-head of polished stone." There follows the caption, "The Professor's Story." The Professor talks to the boys, who listen closely. Then we read, "More than six thousand years ago they came across the Channel," and we see men paddling dug-out canoes arriving on the coast. "For centuries they wandered over the hill-tops, tending their flocks and hunting." A Stone Age family clad in skins slowly advances across the skyline of a hill. The leader, staff in hand, leads a horse. They drive with them a few goats and sheep.

Occupations of the New Stone Age.—Next comes the story of the boy, Fleet, first seen asleep, apparently at one side of a pit-dwelling. He wakes, yawns, and is then seen creeping out of the low entry of the hut, the exterior of which is plainly shown. He climbs the rough stockade of the village and runs down the hillside to a pool in the wooded valley. He drinks, looks up, and listens. "There were bears in the forest in those days." A bear is seen among the tree branches, and Fleet creeps cautiously away. "Sometimes Fleet would visit the flint-mines." He watches two men engaged in surface-mining with antler, pick, and bone shovels, and picks up a flint. "Or inspect the deer-traps." He examines a trap of loosely interwoven branches laid on the ground, whether over a pit or no is not very clear. "He would often go down to the sea for shellfish." Fleet looks for shellfish in shallow pools and sits and eats them on the rocks. He then returns to the village, of which first a general view is given. "They were busy folk up at the village." Close-up scenes of people engaged in various occupations follow.

"They tended sheep"—a flock of sheep is driven within the stockade. "They shaped weapons from flint"—a man chips flint weapons. "And polished them"—he polishes an axe-head against a large stone and tries its fit in a wooden shaft. "They scraped skins"—two children scrape a skin stretched on the ground. "And sewed garments"—a woman sews a skin with a bone needle. "They made pottery"—a woman moulds a clay pot. "And baskets"—another weaves a basket of willow. "They even wove rough cloth"—two people operate a primitive loom. "One day a pedlar of flints came to the village." The pedlar raps at the stockade. Boys see who it is, and tell the news. The villages flock to welcome the pedlar. He becomes the centre of an excited group, who watch him open his bag and display spear-heads and arrow-heads. Fleet's father offers skins to the pedlar; one is rejected in exchange for an axe-head; another is added to effect an exchange. "Fleet's father bought a fine axe-stone." The exchange is made. "And Fleet bought an arrow-head." The pedlar accepts, after some examination, the tooth necklace that Fleet wore, giving him the arrow-head.

Hunting Scenes.—Fleet is then seen alone outside the hut with a straight, slender branch for an arrow-shaft. He cuts a notch at the top, inserts the arrow-head, and binds it to the shaft with sinews. "So Fleet went hunting the deer." Fleet is in the woodland, equipped with bow and arrow. He stalks a herd of deer, and finally climbs a tree and shoots. "This was his first kill." The villagers crowd round Fleet on his arrival home. "The meat was soon cooking"—a fire of bracken and wood on an outside stone hearth is seen, the meat suspended on a raised horizontal branch and tended by a woman. "Fleet told a fine tale that night." Fleet is standing in the firelight telling his story with gusto. This fades into the title "So Fleet became a mighty hunter," when the Professor and the boys are shown again, "and perhaps this is one

of his axe-heads." The boys look interestedly at the flip and the reel ends.

Criticism and appreciation of the film will be found in Dr. Consitt's full report, but I think it will be obvious that the chief defect was that we tried to tell too much, from the teacher's point of view, in a reel lasting only fifteen minutes. It is true that the story has a greater entertainment value, but the film should have dealt more fully with only a few of the points given above. When making a film for young children to watch it is important to give plenty of time to close-ups of objects, and in addition all close-ups should be significant and closely related to the context. Perhaps the worst fault of the cinema amateur is to attempt too much, and not give sufficient "footage" to each individual scene. It is better to limit the number of scenes. For complete success, one should budget for two or three times the final length of film, and not permit a false sense of economy to prevent "re-takes". In fact, one should aim at taking more film than is needed, and do the cutting afterwards.

In the *People of the Axe* film, all the scenes were taken in the open-air, in natural scenery, with the exception of a firelight shot, which was made with the help of a magnesium flare (from Brock's). A head and shoulder close-up in this scene was made in a photographer's studio by electric light, the flickering of the fire being suggested by waving a piece of paper over the floodlight, while a little cigarette smoke helped the illusion.

In the following year we tried to show the life of a village in the Late Bronze or Early Iron period, and we chose as our setting an island village of the Glastonbury type. Mistakenly, as I think now, we introduced a modern

character into the past. A Boy Scout falls asleep and awakens in pre-historic times. The choice of this particular character certainly provided amusement, and entertainment value, but as a general rule I think it is a bad formula for the purely instructional film, except, perhaps, to provide a contrast. For the *People of the Lake*, as it was called, the properties were still more elaborate. Leaf-shaped spears, bronze axes, shields, and sack-cloth tunics were manufactured in large quantities. A photograph shows the ambitious nature of our "lake-village" (p. 28).

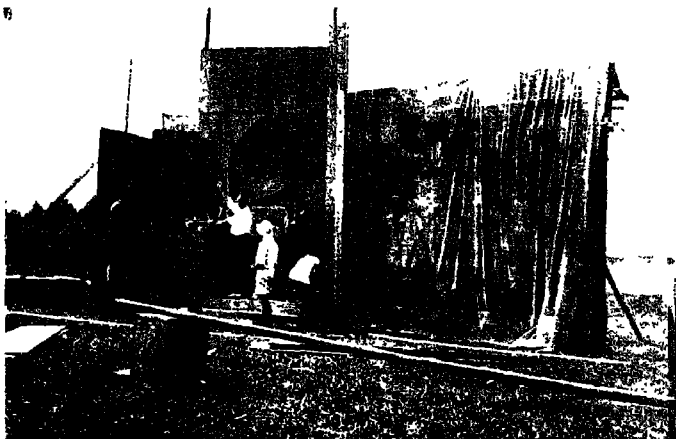
In 1928 we made a three-reel propaganda film for the Scout movement. This film was commercially released throughout the country under a "U" certificate and was shown in over two hundred and fifty theatres. We had, by this time, developed a satisfactory technique, and we went so far as to build interior "sets" on open-air stages. A floor was laid on joists, and beaver-board or three-ply wood-covered frames (or "flats"), erected to form the walls of the room. The setting was given a north light, and many reflectors, of white-painted canvas, and of sheet tin for direct light, were used to reflect the sunlight upon the actors. An awning was built over the set to cut out the direct light of the sun. This business of using reflectors requires careful study. It is the only way, apart from the use of artificial light, by which the characters can be made to stand out from the general flatness of the scene which diffused daylight always gives. The plain reflectors are ranged below the characters, while the tin reflectors, as far as possible, are so placed that a beam of light falls down upon, and behind, the head of the actor (See frontispiece).

In *The Man Who Changed His Mind*, as the Scout film was called, we had a pirate sequence, in the form of a dream. We hired an old three-masted barquentine near Appledore in Devonshire, and our pirate scenes were highly popular with the actors. In this film, as in others, we used not only boys to fill the parts, but also old boys and masters of the school for the older characters. In one scene we had Lord Baden-Powell himself taking part. We had a fire, with a real fire-engine. Several interior sets were built, and I think perhaps our ambition took us to the limit of amateur endurance. We gave quite a sigh of relief when an American film magnate in Wardour Street told us in an eighty-five-word telegram that he liked our film. He asked us to make a dozen more like it and offered to finance us, but we felt that there was a limit even to the educational value of film-making.

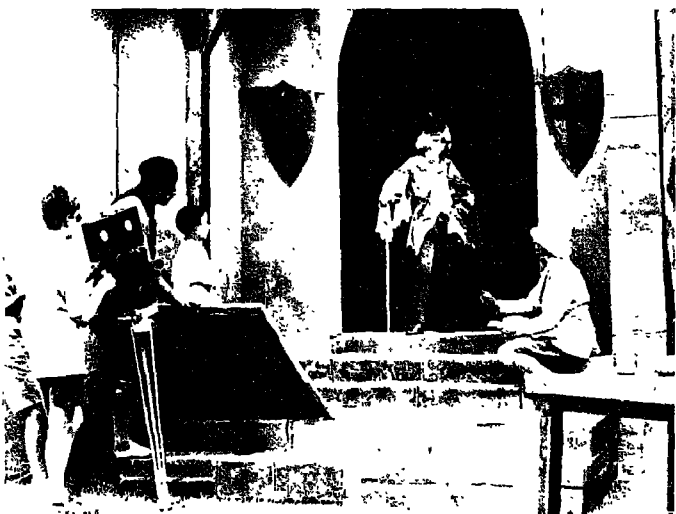
In the following year we made a two-reel film, *The Glittering Sword*, which was a mediaeval legend with "Disarmament" for its theme. Although not strictly a teaching film, we aimed at a fair accuracy of costume and setting. We erected a palace scene and a street scene in the open air. Some photographs are included here of the building of the palace set. In its 16-mm. reduced version¹ the film is chiefly used by junior branches of the League of Nations Union.

I will conclude with a few notes of general advice to teachers who propose to make films as a school activity. I strongly advocate the kind of camera which uses film 16 mm. in width. The smaller gauges, like the 9.5 mm.,

¹ The 16-mm. version may be hired from Ensign, Ltd., High Holborn, W.C.1.



[R. Gow



[R. Gow

FROM "THE CLATTERING SWORD"

The upper picture shows the building of the Palace set, the lower shows the actual filming. Note the reflectors

can give extraordinarily good results, but teaching practice seems to prefer the 16-mm. size, that is if serious work is contemplated. The smaller size will serve well enough if nothing more than a school hobby is intended.

As a minimum, about £20 should pay for the camera and equipment. I do not advocate any experiments with sound cameras for school work. A running commentary, which is added later, is a far enough distant horizon for the school worker. A most important part of the equipment is a good exposure meter. I have found the type which measures the light reflected by the subject, and which operates by turning a graduated iris diaphragm, a thoroughly good guide if always used by the same person, and one who understands the instrument. The need for reflectors has been mentioned above, and the use of them can only be discovered by experiment.

As to the scenario, or the schedule of scenes, a well-schemed outline of the story or the subject of a film is essential. There is no need to lay down a definite plan for the drawing up of the scenario. The good organizer will devise his own method. But as scenes can rarely be "shot" in sequence, it is as well to have a careful system of numbering.

I have always found that boys, carefully chosen and trained, make excellent camera-men. The chief requirement—one will hardly expect him to have great artistic knowledge—is a freedom from mistakes, and he should be reliable in matters of focusing, adjusting the aperture for exposure, and understanding the mechanism of the camera. The positions of responsibility in film-making are very numerous. Careful records must be kept of every shot taken, and "continuity" experts will see that all the

details of succeeding shots will "match" in the final film. Carpentry, scene-painting, and property-making of all kinds require careful organization. The writing of titles or captions for the film is a job for the expert in lettering. The cutting and joining of the film is almost as lengthy a process as the making of the film itself, and infinitely interesting. The processing of the film—development and printing, or in some cases reversal of the negative—should be attempted, if only in a small degree, so that a glimpse may be had of the scientific theory underlying photography.

One final word. When a number of people work together, with enthusiasm, and with one common ideal, the best is brought out in them. Perhaps, after all, that is the chief value of making films in schools. There are other ways of bringing out the best in people. But I have found that this is a good way.

CHAPTER VI

SCOPE AND PRODUCTION OF EDUCATIONAL FILMS

By MARY FIELD, M.A.

Director of "Secrets of Nature" Films

THE educational film is a hybrid, the product of two completely different species, the commercial cinema and the educational "visual aid". Like all hybrids, at first it shocks by its deviation from both the types that have produced it. It is not a section of film made according to accepted cinematic technique, nor is it a familiar piece of educational equipment. After at least twenty years' experience we are still not accustomed to the educational film, and its strangeness continues to make it suspect. It has neither the pace nor the excitement of an entertainment film; it cannot emulate the artificial and carefully planned rhythm of the documentary picture. Therefore it is condemned as bad cinema by many film critics who are not yet accustomed to the new and individual technique which is being evolved for the educational film. At the same time its value is questioned by teachers who do not find it as simple to use as the text-book or atlas, and who miss in it the static repose of the magic lantern. Assailed on both sides by cinéist and educationist, the educational film not only holds its own but continues to gain ground. Its value is becoming realized, its technique appreciated, its scope defined.

What is the scope of the educational film? It has already become a cliché that such a film "supplements the work of the teacher". It is a piece of equipment in his hands,

something for him to use as he himself sees fit, a supplement to his efforts to explain action in terms of words or of still pictures and diagrams.

Since the educational film depends for its value largely on the skill and understanding of the teachers who use it, it must follow that teachers should collaborate closely in the making of such pictures. But collaboration in film production is not easy, as thousands of experts called in, and apparently ignored, by Hollywood and Elstree will agree. Nearly everyone feels he has it in him to write a book, and still more nearly everyone is convinced that he could direct a first-class picture, especially an instructional picture.¹ Only people who have tried to express themselves by means of the written word, the broadcast word, the spoken word, and the still picture, know that the moving picture is the most difficult of all mediums to use for clear logical self-expression. Add to this the intricacy of the technical apparatus through which the film director has to create, and it will be appreciated that film-making is not an easy job for a busy teacher. Frequently, when mention is made of the wide technical knowledge required to make a film, the reply is made that an educational film should be simple. And there indeed lies the trouble. The making of anything really simple demands great technical resources.

Teachers and Producers.—For many years the difficulties of successful collaboration between the two experts, the teacher and the film producer, delayed the advance of the educational film. Some film companies would try to get rid of cheap, badly made pictures in the schools;

¹ Cp. Mr. Gow's remarks, p. 80: Ed.

while people of doubtful academic qualifications persuaded producing companies to sink money in films which no one would accept as authentic. Each party grew to distrust the other.

Fortunately, a useful piece of machinery, through which collaboration can be obtained, has been set up during the last two years by the British Film Institute. The Institute, on which the Film Trade is represented, is a body to which film-producing companies will readily apply for aid, making requests which they might be chary of putting before a wholly academic group. It is strongly supported by learned societies and professional associations, so that the mark of its approval carries very great weight. The Institute works through Panels, each of which deals with a different kind of film, and on these Panels are represented not only experts in the various branches of learning, but practising teachers as well. So round the tables of the Institute are gathered the units of the trilogy necessary to the production of an educational film: the master of a subject, the teacher who expounds it, and the film-producer whose job is to state it by means of moving pictures.

The collaboration of these three parties, which is so necessary for the production of a first-class instructional film, is perpetually being referred to in articles and speeches; but how that collaboration is actually obtained is not always made quite clear. Most films start with someone getting an idea. That "one" may be almost anyone. Sometimes—rarely—it is an expert. Very often it is a teacher who feels the need for some particular film. Equally often it is one of the directors of a film-producing company whose business it is to find out what films will

be acceptable in educational circles. Occasionally a member of the general public supplies an idea, and, from time to time, a studio property-man or carpenter comes forward with a suggestion. The idea is the first thing necessary.

A year or two ago, if University Professors or school-teachers had an idea for a useful educational film, they had to find out the film-producing companies that made such films, write to them all in turn, and interview the ones whose replies showed interest. This required so much labour and so much exploring of unknown territory in the Wardour Street area that few of those learned people did more than think. Now a teacher who feels that a film can be produced to supply a real need in school or university can send his idea to the British Film Institute. The suggestion is put before the Panel within whose province such a film would come, and, if the members of the Panel consider the idea a good one, they approach the film companies which are known to specialize in pictures of the kind. Companies are likely to look with favour on a suggestion supported by a Panel of the Institute and probably an offer to undertake the production will be forthcoming. The Panel will put the originator of the idea in touch with the film-producer, will nominate any other experts that are necessary, and will advise on length and type of film, and on the age of pupil to whom it will be most suited.

The procedure is much the same in the case of a film company that has a project for making an instructional film. A representative of the company explains to a suitable Panel what kind of film is suggested for production. The members of the Panel decide if such a film will be

useful, if it will fit in with any particular syllabus and for what type of school and age of pupil it should be designed. Suitable persons to advise on and to assist in the production are then nominated.

In the comparatively short time in which the Institute has been functioning in this way it has done excellent work, and work which must improve as time goes on and representatives of the academic world and the film world grow used to working together, learn to speak each other's language and come to acknowledge that the other fellow has a reason, and a good one, for the apparently unreasonable demands that he makes. The fact that the personnel of the Panels does not vary much is a great help in the development of this mutual understanding, for, after you have helped on three or four films, the mysteries of a "shooting-script" and the intricacies of a film studio tend to become clearer. For instance, the members of the Physical Education Panel of the Institute, who have been collaborating for eighteen months on the production of films, can all put on paper what they want in the form of a very fair working "script" and can discuss production in studio language. This makes it comparatively easy for the studio executives to give them what they want.

What they want—what do teachers want? They have done, relatively, so little research with films that they find it difficult to formulate their needs, and most experimental work is still being done by the "trial and error" method. A film has to be made and shown to teachers who will then recognize either that it is what they don't want or that it is what they could use. Very occasionally they acclaim it as being what they really need. But criticism is useful, and film-producers have to

remember that it is impossible for them to please everybody. All text-books that have yet been written are such that every teacher who has used them has felt that he could improve upon them. So with films—it is not likely that one film will fit exactly into every teacher's method of giving instruction, but, if the material in it is sufficiently plastic, the film can be used by most teachers and used to advantage.

The Cost of Production.—This uncertainty on the part of teachers—for long a grave drawback to the production of instructional films—is being steadily rectified as time goes by. It is well that this should be so, for unless there is a fairly solid demand for a certain picture and a reasonable likelihood that a considerable body of teachers will use it when once it has been made, it is asking a good deal of the directors of a film company to suggest that they should sink capital in the production; for making an instructional film is not a cheap business.

Many people ask the vague question, "How much does it cost to make an instructional film?" If they paused for one moment to consider, they would realize that there can be no simple answer to this question, for the cost of production must vary with the type of film. But no instructional film can be very cheap, because it must be a good film, easy to look at and to understand, or, in other words, well photographed and intelligently put together. This means it must be made by highly qualified technicians working with good up-to-date equipment. The days have passed when one could make an educational film with an old camera worked by a wild-haired young man who lay on his stomach to get

unusual angles. We need rather the usual production facilities of the film studio. We need cameras with turrets of different lenses, automatic cameras, slow-motion cameras. We need a large variety of camera "dollies" for tracking shots. We need good studio lighting, apparatus for stop-motion photography of plants, for ciné-micrography, and for cartoons and animated diagrams. All this apparatus is necessary, but more necessary still are the brains and the technical knowledge to use the apparatus to its best advantage.

Then the production of the film takes time, which is costly. First of all, when it has been decided to put a picture into production, a "treatment" for the film is drawn up, usually by the person detailed to direct it. This "treatment" is planned in collaboration with the educational experts and the teachers who are working on the production; and is a fairly full description of what the film is to be, how it is to begin, develop, and end. It is laid down what important points are to be stressed and what things are essential to the theme of the film. This is the stage where logical constructive thought is most necessary. An instructional film can only teach one thing and all irrelevances must be ruthlessly removed. Also a film must move steadily forward. The moving picture is unlike the spoken or written word, for it cannot usefully refer back to what has gone before. If a film repeats itself it becomes muddled and incoherent in construction.

The Scenario.—Once the treatment has been agreed upon, a scenario is prepared from it. The director of an instructional film is usually allowed to prepare his scenarios himself, unless he is quite unsuited to the job.

A scenario is really a set of technical instructions for the director and for the film editor, and is not of much interest to the educational collaborators, to whom it frequently reads like fantastic nonsense. A scenario for an instructional film is very frequently more a statement of pious hope than a working list of scenes. For instance, a scenario of a Nature film usually consists of a list of scenes that must be got, a list of scenes that might be got, a list of things that one would like to get, and a list of scenes germane to the subject that can be used to help out the continuity. In the same way the scenario of a film on human geography is often made up of sequences rather than of actual scenes. The working script of a film on a market-town might read roughly as follows:

1. Scenes showing lie of land, especially hills, roads, waterways, railways, bridges, etc.
2. Scenes of surrounding country and farming activities.
3. Going to market.
4. Position of market in relation to town.
5. Market scenes, including what farmer buys as well as sells.

It would be impossible to give more details to these sequences until the director had seen on the spot what could be obtained. The "treatment" of the film would have told him what the picture had to show, and it would be for him to seize on anything he saw that would drive home the lesson of the film. Continuity would have to be carried in his head and in that of the assistant director as they worked. Foresight, imagination, and resource would be needed here.

The scenario of a film on simple physiology or on

hygiene can be worked out more or less in detail and can be adhered to rigidly.

CIRCULATION—THE HEART

EXTRACT FROM SCRIPT.

Picture

8. Diagram interior of heart.
Four chambers are indicated by arrow.
Blood (for blood read arrow) from lungs arriving.
Valve is open—blood is running into other ventricle.
Valve to main artery opens.
Blood runs in.
Another valve opens.
Blood fills last ventricle.
Exit valve to lungs opens, blood goes out.
9. Diagram as in (8) repeated in definite rhythm, both sides together.

(dissolve)

10. Rabbit's heart beating.
- 10a. Close up. Heart in slow motion.
11. Close up. Heart going slowly.
Adrenalin is injected and it quickens up.
12. Close up of boy running and panting.
13. Diagram as (8) of complete heart showing flow away into body.

Cartoon and animated diagram films have to be worked out according to a rigid scenario. When you remember that, often, twenty-four drawings are used to produce one foot of film (for the modern speed of photography and projection requires twenty-four pictures to the second) you can appreciate that there must be no chance of misunderstanding or mistake here.

Scenarios on physical education are definite working scripts as regards the actual movements that are to be presented, but great latitude with regard to angle and to variation of scene has to be allowed to the director

on the spot, for children, and especially very young children, need to be photographed with the same patience and cunning that one devotes to Nature films.

INFANTS' PHYSICAL EDUCATION

Reel 2

EXTRACT FROM SCRIPT.

<i>Picture</i>	<i>Sound</i>
5. Medium Shot. Playground. Children run into their Group Homes, and start to form Circles holding their ropes. —cut—	Commentary. "They run back to Group Homes, where each group forms a circle holding their ropes."
5a. Long Shot. Playground, from roof of school. Continuation of previous shot. Teacher going from group to group to see that all is correct; she walks towards the top of playground. Class start exercise swinging their ropes and rising on the toes to the rhythm of the song. —cut—	Teacher:—"Ready for London Bridge—go!" Sound of class singing—"London Bridge is falling down, etc." (The song is sung through twice.)
5b. Medium Shot. One girl doing exercise. —cut—	Overlay on singing:— Commentary. "Good, except that the arm movement is not big enough. Notice . . .
5c. Close up. Girl's ankles. They move in time to the singing.	. . . her ankles."

Movement of ankles stops.

Singing stops.

Teacher's voice. "Run to put your ropes away and then play 'Follow my Leader'—go!"

6. Medium Shot.

Playground. Class break from circular movement and run to put their ropes away.

Historical or literary reconstructions and films in foreign languages have a detailed scenario which the director is expected to follow exactly as in theatrical productions.

FRENCH EXPERIMENTAL FILM

Part II

EXTRACT FROM SCRIPT.

Picture.

Sound.

21. Medium Shot.

Porter, father, and child. If possible a track up to the carriage—Father inspects it.

Father: "C'est parfait. Nous serons bien ici . . . Mettez les valises dans le filet.

He gives a tip.

Tenez, voilà un bon pourboire."

22. Close up.

Porter. He looks at the coin and a smile spreads over his face.

Porter: "Merci, monsieur. Bon voyage."

23. Interior of carriage. Child bounces from one seat to another as her father enters the carriage.

Child: "Où-vas tu te mettre, papa?"

Father: "Ça m'est absolument égal. Tiens, mets-toi dans le coin contre moi."

—cut on action—

24. Close up.

Father sitting down.

Father: "Je me mettrai dans ce coin-ci en face de toi."

Once a scenario is completed it is analysed; that is, the number of locations, actors, sets, and properties are all carefully worked out. The staff required for the production is chosen for the job, and the necessary number of days of actual photography are allotted to the picture. Then the film is "costed"; salaries, transport, hotel expenses, artists' fees, cost of sets, of electricity, of studio hire, of film stock, and a great many more charges are worked out. If the film is too expensive, economies must be made. Once the cost of the film is settled, the director must do his best to keep within the limits of expense set for him.

Of course these estimates of costs have, to a certain extent, to be elastic. If a production unit is working out of doors, as in all geography pictures, continued bad weather may upset all calculations. It is extremely difficult to say how much film stock will be required in filming children or animals, and it is impossible to put a time-limit to most Nature films. Some may be completed in one season, some in two, while others may easily require four or five years' hard work before enough material can be obtained. A good few are never completed, the subject proving too recalcitrant. Diagrams and studio pictures are, fortunately, more easy to control.

When all the scenes in the scenario have been photographed, the film is then edited into its final shape and here the expert advisers come in again, if they have not been present during the "shooting". There are actually very few films where the educational expert is needed during the filming, though pictures on games and on physical education are outstanding exceptions to this rule. Editing a one-reel picture takes any time from a fortnight

to a month or six weeks. The finished film is then shown to the Panel of the Institute for approval.

One of the few drawbacks to the collaboration between educationists and film producers is the difficulty of finding time to do the work. A busy lecturer or teacher has only a limited time to spare and, in a well-run studio where several productions are in hand at the same time, days in the studio and in the editing-room have to be settled weeks beforehand and the studio schedule, put to pieces like a jig-saw puzzle, has to be rigidly adhered to or chaos results. So, frequently, if the expert cannot attend at the studio on, say, Thursday week, the film has to be put aside for a couple of months and the technicians working at it move on to another job. There is a case in point where, in sixteen months, an expert has had time to complete only one ten-minute film while two others are half completed. Capital has been locked up for a year in the two unfinished pictures, and this method of film-making is definitely not commercial. Experiments are now being made in getting outstanding educationists to approve the scenario and the finished picture, while the "donkey-work" of preparing the treatment and helping in the editing is done by enthusiastic younger teachers, who have more time at their disposal than have their better-known colleagues.

Sound Films.—All this time is necessary if the film is a silent picture, but the labour of production is almost doubled by the use of sound. To the technicians already required on the production staff, one must now add the sound staff, consisting of recorder, camera-man, and at least one floor assistant for each picture. A double

amount of film stock is used for sound pictures. Work¹¹ in the studio becomes more complicated because there is the microphone boom to be manœuvred as well as the camera, and chances of mistakes are doubled, for a scene that is good for sound may be unsuited for use because of a camera defect and vice versa.

"Natural sound", of which people speak so enthusiastically, means the noise of crowds, of engines, machines or animals, and is extremely expensive to fit to pictures. Photographing sound on location requires a sound-recording van manned by a crew of at least five, apart from the film director, if you are going to work at a good speed; and it is well to work quickly, for hotel expenses for six people have a knack of mounting up. A great deal of negative stock is used on these occasions, for the sound-camera uses up some feet of film to reach its correct speed. The signal to start has to be given to the man with the microphone, who may be two fields away, or at the far end of a long workshop. The subject of the scene has to be announced into the microphone so that the sound may be recognizable without an accompanying picture, and by that time at least fifty feet of film stock have gone. Almost the same amount is practically wasted at the other end of the scene. These "natural sounds" are usually fitted to a film after it has been edited; for, just as the camera, unless carefully adjusted to the right viewpoint, cannot bring out the importance of the scene, so the microphone, which is completely unselective, will not pick up the sounds the director requires unless a certain skill is devoted to its manipulation. People not trained to film work forget that their eyes and their ears will pick out

what they want to see and hear, but the camera and the microphone cannot do this. In forcing these two machines to select what the film-goer would naturally expect to see and hear lies a great part of the art of film production.

The expense of making sound pictures is so much greater than that of making silent films that many people query the value of sound films for instruction. Indeed, the educational world is inclined to be rather sharply divided on the merits of "silent" and "sound", and is rather like the army of Lars Porsena where those at the back (representing new film users) cried "Forward", presumably to sound, while those in front (the old pioneers who have installed silent projectors) cried "Back", or use only silent films. This army, one remembers, surged helplessly about and got nowhere.

There is actually no deep cleavage between silent and sound instructional films. It is clear that short films on various topics in physics, electricity or biology gain nothing from sound. Diagram films, such as those on statistics used by Baron Neurath, are better silent and, though it may be heresy to say so, it seems likely that, for teaching purposes, the *Trois Minutes Filmes* made by the Atlantique Film Company of France would be just as useful without the suave voice of the Parisian commentator.

But, on the other hand, many films lose much of their value if they are silent. The value of natural sound for producing an effect of realism cannot be over-emphasized. Films on our own language must necessarily be talking pictures, and so must those on foreign languages and on foreign countries. Historical

reconstructions, without sound, will not be satisfactory to a generation accustomed to films such as *Catherine the Great* or *The Iron Duke*. Again, many geography films now have their commentary in the intonation of the district shown in the picture, and this makes it possible for the class to see what they would see, and hear what they would hear, if they were being taken round by a native of the countryside. Sounds of farm machinery and animals are of value to town children, sounds of factories and towns are of real instructional use to country children.

Physical training films lose perhaps fifty per cent of their value if the sound of the commands is not given, and what is the use of employing a film to show teachers how to take classes in singing-games if you do not hear the children sing? Films on games lose much of their vitality if they are shown in silent form. Nature study films gain much by a good commentary, which can direct attention far better than can the titles of a silent film which are never on the screen while the action is going on. Many people who support silent instructional films do not realize that you can have "sound" films in whose sound-tracks no human voice appears. Some educationists, too, continue to judge commentaries by old-fashioned or inferior interest films, in which someone, with an objectionable voice, takes a deep breath over the main title and never stops speaking until "The End" is thrown on the screen. But these are not modern instructional films to which sound is fitted in new and interesting ways to enhance the educational value of the pictures.

Indeed, with the aid of sound, the scope of the educational film is growing steadily wider and there are few

subjects in the teaching of which films, either sound or silent, cannot usefully be employed. For many years it has been acknowledged that films can be a real help in the teaching of geography, but the modern sound picture is helping teachers to make this subject real and vital. Films on Nature study have long been held to be of value, but while we still have the old simple Nature films, they are also being developed into abstruse pieces of biological research and are designed for University students. Medical films are being widely used, especially by doctors in remote places who are beginning to make a practice of studying operations, with which they are not familiar, through the medium of the film. Films on hygiene obviously have a future and will probably branch out into first-aid and home nursing. There are indications that films are certain to become an aid in the teaching of foreign languages. On every side teachers are demanding films to use in the teaching of history, and every effort is being made to help them to crystallize their demands. Research is being done into the possibilities of making films to help art-teachers; and time and opportunity only are needed for the production of films to be used for musical appreciation lessons. One of the most interesting academic battles of the near future is going to be waged over the introduction of films into literature classes and over the defining of what a literature film should be. Science, in all its branches, can make use of animated cartoons in increasing quantities, and for this subject short endless bands, that project the same movement continuously, are evidently of real value.

Most successful of all instructional films probably, are films for instruction in movement, such as the films

on games and sports; and in this connection mention should be made of the series of films on class work in Physical Education which are intended for refresher courses for teachers, and which are proving to be of very real educational value.

Teachers ask for films on vocational guidance; teachers ask for films as an aid to religious instruction; they want films for use in domestic science courses. Films are needed for use in every type of school, for use in Universities, in Training Colleges, and in Adult Educational Institutes.

Everywhere the scope of the educational film is widening and this is due to two factors. One is that practically all educational films are now available in sub-standard 16-mm. size, which is easy to handle and for which excellent projectors may be bought on the hire-purchase system. The other factor is that film-producers and educationists are learning to work together so that they are producing instructional films which have the virtue of providing the kind of instruction demanded by the curriculum, without being in any way technically inferior to ordinary amusement films.

CHAPTER VII

USING A PROJECTOR

By H. D. WALEY

MODERN projectors have been so simplified that it is not essential to understand very fully the mechanism they employ. Yet efficient use will be facilitated by such understanding and it will, therefore, be worth while to give a short description of a typical machine.

All cinema projectors consist essentially of the same parts and the diagram on page 115 shows these parts and their relationship to each other in a very schematized form.

The Intermittent.—Film projectors give an illusion of continuous motion by presenting on the screen a very rapid succession of still pictures. Sixteen times (or, for sound, twenty-four times) a second a fresh picture is presented on the screen, held stationary there, and whisked away again, after which a new picture has to be presented which must be in perfect register with the old one. The mechanism which produces this effect, by a series of rapid snatches at the film, is called the “intermittent” or “pull-down”, and is represented in the diagram by a claw engaging the film at the bottom of the gate (at *i* in the diagram). Claw movements are the standard mechanisms for 35-mm. cameras and 16-mm. cameras and projectors. The claw mechanism imparts intermittent motion to the film without itself undergoing the wear and tear of continually starting and stopping,

since it runs at an even speed, merely withdrawing from the film perforations during the idle part of its travel. The alternative—the maltese cross—is standard for 35-mm. projectors and has recently come into favour for 16-mm. sound projectors. The maltese cross is in essence a special form of gearing by means of which a driving wheel running continuously propels a driven wheel in a series of jerks. A maltese cross picture-shift has very definite limitations of speed. It cannot in practice reduce the shift-period to much below one-fifth of the stationary period. Its merit is that it is exceedingly kind to the film. Claw mechanisms can be designed to run at a very high speed.

The Bell-Howell 16-mm. projector mechanism, for example, has a shift period which is only just above one-tenth of the stationary period. This point is of importance because a rapid shift enhances the effective light output of a projector.

Siemens' 16-mm. projectors make use of an intermittent mechanism of a different type, the whole width of the film receiving a downward push from a shaped fibre block furnished with two claws which register in the perforations. This is a highly efficient device and in the "Super" projector produces a shift as speedy as that of the Bell-Howell mechanism mentioned above. All intermittent mechanisms are highly sensitive to proper lubrication and the maker's instructions should be followed carefully.

The Lamp.—The earliest source of light used for film-projection was the carbon arc, which still remains without a rival for professional purposes. For amateur purposes

the arc is unsuitable because it requires a bulky lamp-house and resistances, special current supply, is not fool-proof in its functioning, and increases fire-risks.

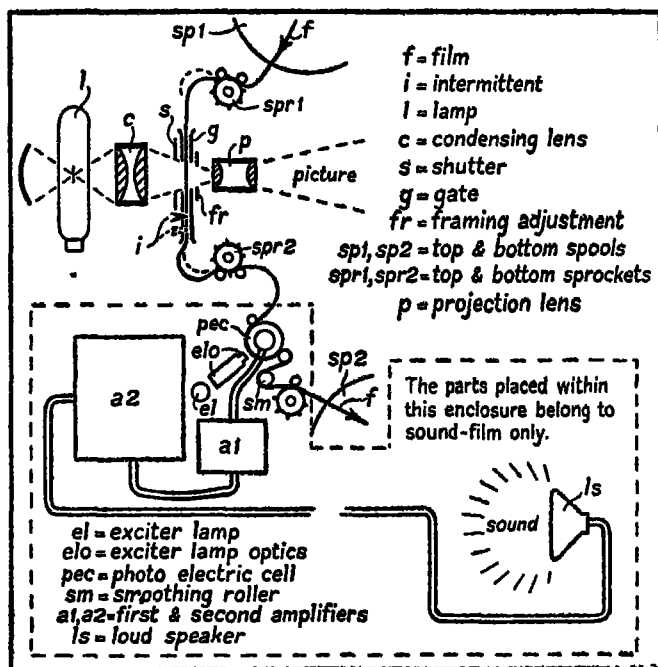


DIAGRAM SHOWING THE PRINCIPAL PARTS OF A PROJECTOR

The key mentions the parts in the order in which they appear in the description

Designers of filament lamps have, therefore, exerted themselves to produce lamps suitable for amateur cinema projection. This has involved concentrating the filament into a small volume and, further, keeping down the total

size of the glass bulb. Naturally these characteristics tend to give the lamp a short burning life, and a spare lamp should always be kept handy. In removing a burnt-out lamp during the show care must be taken to avoid scorching the fingers.

In the case of 16-mm. lamps using 500 watts and over it does not do to reckon on a total burning life of more than fifty hours and frequently they fall far short of this. Their efficient life is shorter still owing to blackening of the glass. The bulkier lamps used for 35-mm. projection enjoy longer lives. One thousand-watt lamps connected to the full mains voltage will last for one hundred hours or more, while 30-volt 900 watt and 15-volt 750-watt lamps have still longer lives.

In most 16-mm. projectors the centring of the lamp-filament to the optical system is automatic, but should a lamp by any chance get "off centre" the loss of illumination will be very marked. The best way of checking the position of the lamp and mirror is to hold a magnifying glass in the beam near the projector, so that an image of the lamp filaments appears on the screen. This image will appear in a circle of light on the screen, placed exactly as the lamp is placed in the optical system of the projector, right way up and right way round. The image of the filament should appear in the centre of the circle and the fainter filament images thrown by the mirror should appear between the main filament images.

The Condensing Lens.—The function of the condensing lens is to collect the diverging rays from the lamp-filament and concentrate them on to the film in the gate, and, through the film, on the back glass of the projection

lens. Heat-resisting glass is used for good-quality condensing lenses, but, owing to the present demand for compactness combined with high lamp-wattage, cracks caused by heat may appear. It is good policy to replace the damaged lens at once, as otherwise it may fall from its mount at an inconvenient moment. Behind the lamp a concave mirror is usually placed which considerably increases the efficiency of the optical system. The condensing lens should be kept clean and the mirror polished occasionally.

The Shutter.—The shutter is a device for preventing the movement of the film from appearing on the screen while one picture is being substituted for another. The shutter interrupts the light and darkens the screen during that period. In early projectors the shutter darkened the screen only during the shift period, but it was found that the eye was over-sensitive to the alteration of light and dark phases thus set up and registered them, with considerable discomfort, as “flicker”.

The introduction of an extra blade (or of two extra blades in the three-bladed shutter), which broke these alterations up into a more rapid rhythm, eliminated flicker.

The best position for the shutter is between the light and film-gate, since it then acts as a heat-shield for the film and does not interfere with the use of projection lenses of different focal lengths.

In a modern projector shutter trouble is most unusual, but should the shutter somehow become displaced a disagreeable trailing of high lights on the screen will result. This will be most visible in the titles. A white

trail above the lettering indicates that the shutter is too advanced, below the lettering that it is retarded in action.

The Gate.—The passage through which the intermittent mechanism pulls the film is called the “gate”. The function of the gate is to offer just so much resistance to the passage of the film as may be sufficient to check it in its downward course at the end of the intermittent mechanism’s action. Too little gate pressure would cause “overshooting”, which results in a jumpy screen-image. Too much gate pressure would strain the intermittent mechanism and quickly wear out the film.

Stainless steel is the material most used now for the lining of the gate. It should be kept clean and free from oil or grease. It is very important to avoid scratching the lining of the gate, as a rough place may gather a hard lump of matter scraped from the film. This is particularly liable to occur with “green” (i.e. new) 35-mm. prints which have not been waxed or given some other suitable treatment to overcome the tendency of the emulsion to leave a deposit in the gate. Lumps are also liable to form on the shoe or roller which holds the film against the intermittent sprocket, where one is used. Should such a lump form it may be removed with the edge of a copper coin, after which the surface must be thoroughly burnished. Trouble of this kind, however, seldom occurs with the light gates of 16-mm. machines. These generally require nothing more than to be kept free from fluff, which may mar the picture by protruding into the frame and appearing in outline on the screen, enormously enlarged. Keeping the gate free from accretions is particularly important in the case of sound-on-

film machines, as damage to the sound-track may quickly be done by neglect of this point.

Various circumstances may give rise to slight discrepancies in the relationship of perforation to frame both in 16-mm. and 35-mm. film. This is compensated for by adjustable framing devices of various sorts.

Above and below the gate loops of slack film must be left, to allow for the fact that the film is being moved to and from the gate continuously, while its motion in the gate is discontinuous. The tightening up of either of these loops may occur through careless threading, a buckled or crooked joint, or previously damaged perforations. If either loop is lost the picture on the screen will jump and the mechanism will knock. It is essential to stop the projector at once as every inch of film thus run may be ruined. Some designers have incorporated a useful device which stops the projector automatically if the loop is lost.

The Projection Lens.—The function of the projection lens is to produce an enlarged image of the film on the screen with as little loss of definition as possible. A high-grade lens, accurately ground to a millionth of an inch, is a necessity for good projection, since it gives more light without an increase in heat. The projection lens should be kept scrupulously clean, but, as it is made of soft glass, care should be taken not to scratch it. Clean linen rag and methylated spirits may be used. Special lens-cleaning outfits can be purchased for a few shillings.

The focal length of the projection lens determines the size of the picture at a given throw (See the table given at the end of Chapter II, p. 45).

Sound-on-Film Parts.—The following parts are those which sound-on-film projectors possess in addition to the parts already mentioned: *the smoother* eliminates, by the action of a fly-wheel, the tendency of the film to run in ripples. This tendency, if uncorrected, would of course render itself in the sound reproduction as fluctuation of pitch.

The exciter lamp is the projection lamp of the sound track. Its light concentrated by a condensing lens and focussed by a projection lens, casts a reduced image of the "slit" upon the sound track which passes through it to the photo-electric cells.

Photo-Electric Cell.—This cell translates light-variations into variation of electric current. This current passes into the *first-stage amplifier*. This magnifies it until it has sufficient strength to pass into the *second-stage amplifier*. Here it is magnified again until it has sufficient strength to operate the *loud-speaker*, which translates electrical variations into terms of sound.

Projection Technique.—It might be thought from the list of possible troubles which follows that the path of the projectionist is necessarily a thorny one. But, once the projector has been satisfactorily set up in a given place, trouble-free projection may be confidently expected, and even the itinerant projectionist may be fortunate enough to keep out of trouble for long periods on end.

Inspection of Films.—The first event preceding a show is generally the receipt of the films. These should be inspected

at once to confirm that the films sent are those expected. When the film is drawn downwards from the spool the images should be upside-down. If they are not, the film requires rewinding before it is ready to show.

Fuses.—The next point to be examined is whether the fuses in the electric circuit, off which the projector is to run, will bear the load. Lighting circuits are normally fitted with fuse wires which melt at a load of 5 amperes. The purchaser of a projector should therefore make a point of ascertaining from the dealer what load his projector draws. Power circuits will generally carry 10 or 15 amperes. It must be borne in mind that usually each point has two fuses in its circuit. It is desirable to keep handy some fuse-wire of the correct amperage.

Plugging-in.—The next point which arises is the joining of the projector to the mains supply. The following three alternatives present themselves regarding plugging-in: (1) a lamp-holder; (2) a lighting-circuit wall-plug; (3) a power-circuit wall-plug.

For portable shows it is as well to carry an adapter, so that either of the alternatives (1) or (2) may be made use of at will. With regard to alternative (3) there exist so many varieties of power-plug that it is impossible to provide oneself with a complete range of terminals, and the best plan is to include in one's kit a small screw-driver suitable for fitting on to the projector lead a terminal borrowed from plug-fittings of the circuit on which one is to work. The next point is to ascertain the voltage and to adjust the resistance accordingly. It is as well to do this at an early stage as otherwise one may

overlook it during the rush of last-moment preparations and burn out the projection lamp.

Placing the Screen.—Next consider the placing of the screen. A high screen prevents the front rows of the audience obstructing the view of the back rows, but it should not be so high that a line from the eyes of the front row to the top of screen tilts more than 35 degrees above the horizontal.¹

Placing the Projector.—Given the focal length of the projection lens and the size of picture desired the distance from screen to projector can be ascertained from the table given at the end of Chapter II, p. 45. A difficulty will arise if the projector lead is too short to reach the nearest point available for plugging-in, and where there is any doubt on this point an extension should be prepared beforehand consisting of a length of flex ready fitted with suitable terminals. In any event great care should be taken to arrange the electric connections so that they may not risk fouling the feet or elbows of the audience as they enter and leave.

Circuit Troubles.—We will now assume that the screen and projector are in place and connected to the mains supply. The next step is to throw the projector's field of light on to the screen in order to confirm that the projector faces the screen squarely and is at the right distance from it. There is no need to darken the room yet. The moment may now occur at which the would-be projectionist feels


¹ This means that the distance between the screen and the nearest spectators must be at least equal to three-quarters of the height of the top of the screen above their eyes.

certain that he has made all necessary connections and switched on all necessary switches, yet no sign of life can be coaxed from any part of the projector. In this case he should first look for forgotten switches, and then tighten up any possible loose connections. These may be at his terminal junctions or in his resistance. The screw-in studs which set some types of resistance for the right voltage occasionally refuse to screw down fully at the first attempt. If these first steps fail he must test the circuit to locate the trouble.

Testing to Locate.—His cheapest instrument for this purpose is a test lamp, and the really prudent projectionist will never attempt a fit-up show without one. This simply consists of an ordinary lamp in a holder, from the back of which protrude two separate pieces of rather stout insulated wire. The bared ends of these wires are placed in contact with the various terminals which should be "live", working backwards from the projector to the mains, until the lamp is lit. If the lamp finally fails to light at the direct junction to the mains it is almost certain that a fuse has blown. The user of a sound-on-film machine should ascertain, before he assumes that all is ready, whether the current is actually through to his loud-speaker. He may do this by interrupting the light from the exciter-lamp with a strip of paper, removing the obstruction again, and listening for a "plop" from the speaker.

Threading-up.—Assuming now that we have to hand the right film correctly wound and the projector successfully connected to the mains, thread the projector, being

careful to leave proper loops, and run for a few seconds in order to make sure that the claw is engaging the perforations and that the bottom spool is taking the film up properly. Adjust focus and framing and the preparations for showing are complete.



Speed.—Silent machines (and some sound machines) incorporate a speed-regulator. As high speed involves noisy running, wear on film and mechanism, as well as unnatural speed of motion on the screen, the speed regulator should be set for the slowest pace which eliminates flicker entirely. One form of trouble which may overtake the projectionist whose machine is old or neglected is the refusal of the motor to pick up sufficient speed. On these occasions one appreciates the advantage of a projector which can be hand-turned should the necessity arise. Insufficient lubrication either in the motor bearings or projector bearings may be the cause and suitable oil should always be to hand. On an old projector, worn brushes in the motor might be the cause, and care should be taken to replace old brushes as soon as sparking and irregular speed are noticed.

Belt Trouble.—This is now almost a thing of the past, many projectors having eliminated belts from their design. Where spring belts are used it is desirable to have a spare belt handy, because when the belt breaks while running it generally flies a surprising distance and may be difficult to retrieve.

Film Breakage.—Breakage of the film during a show is not a probable complication, unless the film is already

in very bad condition or negligently joined. Should it occur there is a good deal to be said for making a temporary joint simply to enable the lower spool to continue taking the film on to itself. For instance, a piece of fuse wire about two inches long can be used to bind the ends of film together by being passed through their perforations. Of course, before a rough joint of this sort is made the broken end must be carefully threaded through the projector so that the joint enters the lower spool directly, without having to pass the gate or any sprocket wheels or rollers. Also, care must be taken not to hand the film on to anyone else for projection until a proper joint has been made.

Film-joining.—Making a perfect joint in non-flam film requires a certain amount of practice. If too little cement is used or the emulsion is insufficiently scraped away or the surfaces to be joined are greasy then the ends may either make no pretence of joining or, what is worse, appear to join without actually having a firm hold, and part company in the gate of the projector. To avoid this the joint should be tested with a firm tug as soon as it is dry. The use of too much cement will result in a joint which swells into a hard buckled kink some hours afterwards. Quickness is the principal secret of successful film joining as the essential ingredients of all film-cements are very volatile. The most efficient cements are those sold ready made up for the purpose, but, as substitutes procurable from the local chemist, glacial acetic acid or acetone may be used, assuming, of course, that the film is safety film. For celluloid amyl acetate is used.

Safety Film and Celluloid.—Only two substances are in current use for the manufacture of cinema film: *celluloid* (or “nitrate”) and *cellulose acetate*, the latter being described as “non-flam”, or “safety” film. The ordinary reels in circulation at cinema theatres are all celluloid, since it costs less in the first instance and lasts longer. Sub-standard film, on the other hand, is on acetate stock. This is one of the strongest arguments in favour of the use of sub-standard apparatus for amateur projection. Where 35-mm. film is used there is, apart from the danger which always attends the use of celluloid, a perpetual danger of confusion between celluloid film and safety film. The margin of safety-film stock is generally marked with the words “safety film” (or “sicherheitsfilm”) at intervals of a foot or so in black letters. But it has to be borne in mind that the marginal lettering on the negative will print through the positive and appear there in white. The uninitiated projectionist may thus be alarmed to see the words “Nitrate film” blazoned boldly in white letters on the margin of a reel which should be and actually is, non-flam. This is a case of needless alarm, but even worse are cases of ill-founded security. Unfortunately, the projectionist must be on his guard against tins labelled “non-flam copy” into which a celluloid copy has been inserted in error, the supplying of a celluloid copy, properly labelled as such, when a non-flam copy has been asked for, and—the hardest of all to detect—the insertion of lengths of celluloid film into a copy supposedly consisting entirely of non-flam film.

Safety Regulations.—One safety regulation which affects users of non-flam film is the Children’s Act of 1908,

which provides that where the majority of persons present at any "entertainment" are under fourteen, and their number exceeds one hundred, there must be an adequate number of adult attendants to prevent overcrowding and to control the movements of the audience.

Moreover, for all who propose to assemble large audiences a careful perusal of the Home Office's *Manual of Safety Requirements in Entertainment* is clearly advisable. This deals principally with the need for adequate exits, conspicuously marked as such.

Those who propose to use celluloid films should study the Home Office Regulations 983,¹ as for showing these in school halls a licence is requisite.

Darkening the Room.—It is not always possible to darken the room completely for projection, and even where possible it may not be desired—whether for reasons of safety, discipline, teaching method, or ventilation. The brilliance of so-called "daylight" projection can never rival that of projection in darkness, but reasonably good results can be achieved by shielding the screen from extraneous light and increasing the intensity of the projection light as far as possible. In order to accomplish this the picture must be kept as small as possible, and it is desirable, unless rear projection is employed, to use a silver screen and to concentrate the class directly in front of it.

Rear Projection.—As explained in Chapter II (p. 43) the type of screen most often used for daylight projection ,

¹ Obtainable from H M. Stationery Office, Kingsway, W.C.2, post free 8d.

is the transparent screen, which gives greater light intensity than any opaque screen. For class-room purposes the transparent screen has a further advantage: it places the teacher near his screen and in front of his class. Nevertheless, this advantage can be largely discounted, since he will have to operate the machine from the back of the screen. He would then still have the class under his eye, but would no longer be able to see the pictures themselves. The difficulty involved is that it is necessary to connect the projector to the screen by a light-proof tunnel. Such a tunnel, though easily constructed in plywood or improvised from a couple of tea-chests, is clearly rather a clumsy object. The same problem confronts the designers of the "daylight screen" projectors, which are used for commercial demonstrations and displays. Some have solved it by using a very small screen and consequently a very short tunnel also, others by mounting the screen on an upright cabinet and using its height to gain length of throw by means of prisms and mirrors. Several other variations of this sort of device are possible and further experiment in this direction in class-rooms would yield valuable data.

Endless Bands.—Another field which lies open for experiment is the use in the class-room of short endless bands. These enable the teacher to take a single point and repeat the film illustration of it until comprehension has been well assured. Apparatus for running bands up to fifteen feet long can easily be improvised. The loop can be draped over a stainless steel clothes-hook, mounted on an upright wooden pole placed behind the projector.

NOTE I

Desirable Accessories for All Sets

Spare lamp.
 Joining press.
 Film cement.
 Small brush.
 Lens cleaning outfit.
 Lubricating oil.
 Fuse wire (10 or 15 amps.).
 Spare belt (if spring belts are used).
 Magnifying glass.

NOTE II

For Travelling Sets

Terminal adapter for lead.
 Extra length of flex for lead.
 Small screwdriver.
 Test lamp.

APPENDIX

CONTENTS OF THE PRINCIPAL FILM LIBRARIES

G. B. Instructional, Film House, Wardour Street, W.1.

Obtainable on 35-mm. sound-on-film and 16-mm. sound-on-film. (It is also proposed to produce some 16-mm. silent copies.)

Biology	17
General Science	3
Physical Education (7 to follow)	3
Industry	2
Language	2
Geography	4
Hygiene	2
Literature	1
Eminent Scientists	8
Domestic Science	4

Stewart Films, 5, Denmark Street, W.C.2.

Obtainable on 35-mm. sound on-film and 16-mm. sound-on-film.

Vocational Training	1
Engineering	1
Electricity	1
Mensuration	1
Travel	1
Horticulture	1

Obtainable on 35-mm. sound-on-film only.

Engineering	1
---------------------	---

Pathé Pictures, 84, Wardour Street, W.1.

Obtainable on 35-mm. sound-on-film. (It is intended to produce 16-mm. sound-on-film copies of all films in this library.)

Geography	..	..	..	..	..	52
Botany	..	..	..	..	..	9
Animal Studies	..	..	..	..	..	10
Bird Life..	..	..	..	..	..	20
Insect Life	..	..	..	..	..	28
Aquatic Studies	..	..	..	..	..	13
Physiology	..	..	..	..	..	1
Engineering (14 reels)	..	..	..	..	..	2
Aeronautics	..	..	..	..	..	3
Nature Study	..	..	..	..	..	12
Industry	..	..	..	..	..	1
Agriculture (6 reels)	..	..	..	..	..	2
Architecture	..	..	..	..	..	1
Scripture	..	..	..	..	..	1
Health	..	..	..	..	..	1
Language	..	..	..	..	..	2
History	..	..	..	..	..	9

Obtainable on 35-mm. silent.

Botany	..	..	..	..	..	18
Animal Studies	..	..	..	..	..	6
Bird Life..	..	..	..	..	..	8
Insect Life	..	..	..	..	..	8
Aquatic Studies	..	..	..	..	..	6
Physics	..	..	..	..	..	1
History	..	..	..	..	..	1

Visual Education, Temple Road, Cricklewood.

Obtainable on 35-mm. silent (33 of these reels are obtainable on non-flam).

Geography	..	..	..	..	..	42
Natural History	..	..	..	..	..	42
History	..	..	..	..	..	20
Sports	..	..	..	..	..	15
Art	..	..	..	..	..	2
Astronomy	..	..	..	..	..	5
Scripture	..	..	..	..	..	2

Engineering	3
General Knowledge	4
Industry	5
Literature	8
Physics	7
Physiology	6

Obtainable on 16-mm. silent.

Geography	2
Economic Geography	3
Historical Geography	7
Natural History	16
Scripture	1
Sport	2

*Imperial Institute and G.P.O. Film Library, Imperial Institute,
S. Kensington.*

Obtainable on 35-mm. non-flam silent, 16-mm. silent,
and 9.5 mm.

I. Communications (including P.O. Services)	20
II. General—	
Empire	6
United Kingdom (industrial and geographical)	16
Empire (industrial and geographical)	33
III. Class-room	36
(Subjects similar to Part II but specially adapted for school use.)	

Obtainable on 35-mm. celluloid silent.

II. United Kingdom (industrial and geographical)	6
Empire (industrial and geographical) ..	58

Obtainable on 35-mm. non-flam silent.

II. United Kingdom (industrial and geographical)	40
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Obtainable on 35-mm. non-flam silent and 16-mm. silent.

II. United Kingdom (industrial and geographical)	17
Empire (industrial and geographical) ..	22

Obtainable on 16-mm. silent.

II. United Kingdom (industrial and geographical)	3
Empire (industrial and geographical) ..	18

Western Electric Co., Bush House, Aldwych, W.C.

Obtainable only with hire of apparatus (16-mm. sound-on-disc) and operator.

History, Geography, etc. (25 reels) ..	5
Religious (6 reels)	3
International Affairs	6
Travel, etc. (20 reels)	17
Music	8
Physical Science	6
Nature Study (6 reels)	5
General Knowledge	4
Sport	9
Industrial (5 reels)	3

L.M.B. Films, 25, Denmark Street, W.C.2.

Obtainable on 35-mm. celluloid sound-on-film.

Travel	11
Industrial Processes	5
Interest	3

Kodak Library, 65, Kingsway, W.C.

Obtainable on 16-mm. silent.

Travel	130
Industrial Processes	70
Natural History	55
Sports	10
Science	7
History	1

Ensign Library, 88, High Holborn, W.C.1.

Obtainable on 16-mm. silent.

Travel	27
Industrial Processes	5
Natural History	23
Sports	18
History	8
Astronomy	1

Educational Film Bureau, 101, Wardour Street, W.1.

Obtainable on 35-mm. celluloid, silent.

Travel	46
Industries	7
Health	8

Obtainable on 35-mm. non-flam silent.

Travel	2
Industries	9
Health	18

Obtainable on 16-mm. silent.

Travel	21
Industries	18
Health	18

The *Dance Kaufmann* Library of scientific diagrams (and similar subjects) is at the time of writing being reorganized. Information may be obtained through the Film Institute or from 18, Upper Stanhope Street, Liverpool, 8.

Films are supplied (35-mm., 16-mm., 9.5-mm., all non-flam), either on endless bands or in 50-ft. reels, repeating a single effect from six to twenty-five times. The bands require an adaptor, the reels can be run on any machine.

Cecil Cattermoul, Ltd., 184, Wardour Street, W.1. Specializes in the distribution of continental films to Film Societies and other non-professional services.

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A comprehensive list of books of general interest dealing with the subject is obtainable from the British Film Institute, price 1d.

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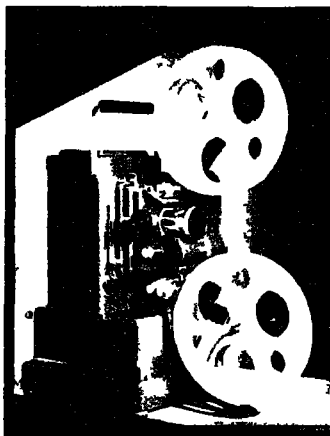
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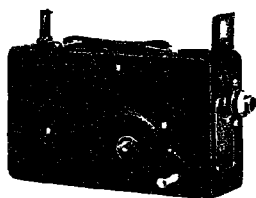
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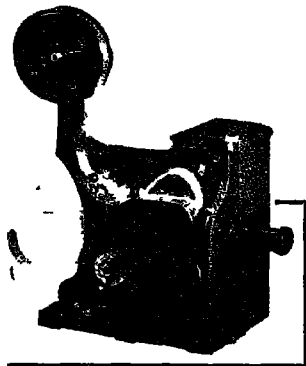
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